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VOLUME III

CHICAGO, U. S. A.
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THE PENINSULA OF YUCATAN.

The region of this Flora lies north of the red line.

FIELD COLUMBIAN MUSEUM.

PUBLICATION 69.

BOTANICAL SERIES. VOL. III, NO. 1.

PLANTÆ YUCATANÆ.

(*REGIONIS ANTILLANÆ*)

PLANTS OF THE INSULAR, COASTAL AND PLAIN REGIONS OF THE PENINSULA OF YUCATAN, MEXICO.

CHARLES FREDERICK MILLSPAUGH, M.D.

Curator Department of Botany.

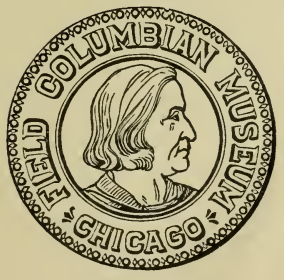
FASCICLE I.

POLYPODIACEÆ AND **SCHIZAEACEÆ.**

CHARLES F. MILLSPAUGH.

GRAMINEÆ AND **CYPERACEÆ.**

CHARLES F. MILLSPAUGH AND AGNES CHASE.



CHICAGO, U. S. A.

February, 1903.

ANNOUNCEMENT.

After several years of collection and herbarium work on the plants of the insular, coastal and plain regions of Yucatan, being from the start deeply impressed by the peculiarities most of the species present in their habit characters, form of leaf, and their proneness to variation for protective and adaptive purposes, I have been compelled to settle upon some specific character which is not affected by environmental influences in order to avoid the error of creating a large number of species and varieties upon what I have become positive are but form distinctions due to the peculiar conditions present in this region where the fittest are struggling for survival. The specific character found to be constant has proven to be the fruit and especially its seed, no matter how great a variation from the type and from the species as found in other and more normal habitat the other characters may show. The reproductive characters must hold their truth to the type in order that perpetuation of the species may result.

Feeling confident that a positive specific character exists in the fruit and seed of all species, and finding that this character is usually the last to be adequately described in botanical publications, it is upon this character that I have based the special features of this work.

The enumeration of the species of this region will occupy the whole of Volume III of the Botanical Series of these Publications, the fascicles of which will appear from time to time as opportunity permits without regard to the natural sequence of the orders, though each natural order when issued will be complete as far as the knowledge of our species obtains.

PTERIDOPHYTA.

FILICINEÆ.*

CHARLES F. MILLSPAUGH, M.D.

Leafy plants, with the leaves (*fronds*) entire or cut into many smaller leaflets (*pinnules*) and usually raised upon a polished, hairy, or scaly petiole (*stipe*), rising from a generally prostrate or assurgent rootstock. Fronds usually rolled up (*circinate*) in the bud, and when in fruit bearing on the under surface (commonly upon the veins or along the margin) the fruit dots (*sori*), either bare, or more or less covered by the revolute margin of the leaf, or by a separate membrane (*indusium*); and consisting of one to many 1-celled spore-cases (*sporangia*), opening in various ways and discharging numerous minute seeds (*spores*).

Fronds all alike.

Margin not revolute.	
Sori globular—	
Indusium circular, smooth	*Tectaria trifoliata.*
acicular hairy	*Dryopteris patens.*
Indusium none—	
Sori marginal, distinct	*Polypodium polypodioides.*
confluent	*Phegopteris rudis.*
Sori intramarginal	*Goniopteris tetragona.*
Sori in many parallel lines	*Campyloneuron phyllitidis.*
two parallel lines only	*Phymatodes lycopodioides.*
Sori scattered	*Goniopteris reptans.*
Sori oblong—	
Indusium scaphoid, the margin hairy	*Asplenium pumilum.*
the margin glabrous	*Asplenium dentatum.*
Sori lineal-continuous, epinerval—	
Indusium none—	
Sori completely covering the veinlets	*Hemionitis palmata.*
Margins revolute.	
Sori lineal-continuous	*Pteridium caudatum.*
Sori lineal-interrupted—	
Pinnules sinuate-lobed, strigose	*Pellæa aspera.*
hairy	*Cheilanthes leucopoda.*
glabrous	*Cheilanthes microphylla.*
Pinnules rhomboid, smooth	*Adiantum tenerum.*
hairy beneath	*Adiantum tricholepis.*

Fronds of two sorts, the sterile pinnate.

Sporangia ovoid, ridged	*Ornithopteris cicutaria.*
veined	*Ornithopteris adiantifolia.*
Sporangia globular	*Ornithopteris Wrightii.*

*The cuts represent a frond or a pinnule natural size unless otherwise stated; and a sorus, sporangium and spore of relatively the same magnification throughout the series.

CYATHEACEÆ.

Sori dorsal, more or less globose, situated usually at or near the forking of a vein, and consisting of an indusium enclosing from 1–many sporangia rising from a central projecting axis.

HEMITELIA.

Sori globose, each solitary on a veinlet. Indusium an ovate, concave, torn scale, situated at the lower side of the base.

[**Hemitelia Hartii** Baker. Jour. Bot. 1886: 243.

This species is reported as having been collected by Dr. Gaumer, on the island of Cozumel in 1885. I have seen no specimen of it in Dr. Gaumer's personal herbarium, nor have I met with it either personally, or in collections from the peninsula or islands.]

POLYPODIACEÆ.

Sporangia raised upon a stalk and collected in dots, lines, or variously shaped clusters, their surfaces cellular-reticulated, their margin an incomplete many-jointed ring which by straightening out at maturity ruptures the sporangium horizontally, allowing the discharge of the spores. Sori often indusiate.

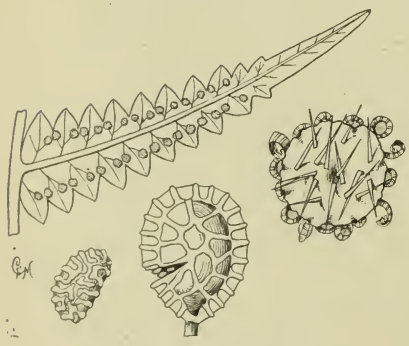
ASPIDIEÆ.

Sori round, borne on the back or rarely at the apex of the veins. Indusium flat or flattish, scarious, orbicular and peltate at the center, covering the sporangia. Spores phaseoloid, more or less invested with a thin, transparent, free margined membrane.

Dryopteris patens (Sw.) Ktze.

Aspidium patens Sw., *Nephrodium patens* Desv.

Fronds pinnatisect, segments lanceolate-acuminate, pinnatifid beyond or to the middle, sessile, the lowest somewhat decrescent; lobes cuneate or often falcate, bluntish, entire, the upper basal one enlarged and pinnatifid; veins simple, free, or the basal ones meeting at the sinus between the segments. Sori at the ends of the free veinlets; indusium superior, small, plane and circular with an erose margin, the upper surface aciculate-hairy; sporangia broadly anastomose-ridged; spores phaseoloid, their surfaces marked by many broad, flat anastomosing ridges.



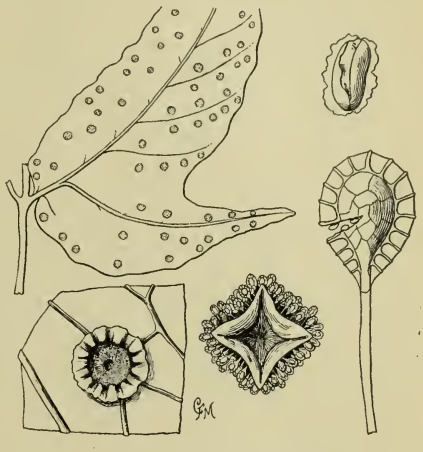
Yucatec name: CULANTRILLO BLANCO, "White Maiden-hair." It is said to be used with marvelous results in domestic practice as an anti-purgative, and remedy for post-partum colic.

Hab.—Damp places, in rich mold: Woodlands near Merida, *Valdez 19;* Chichankanab, *Gaumer 1341, 2310;* and near the center of Cozumel, *Millspaugh Pl. Utowanæ 1561.* In fruit at all seasons. Our specimens are not nearly so large nor full fruited as those of Jamaica, but greatly resemble in form those met with at St. Thomas, their growth being about 25–35 cm.

Tectaria trifoliata (L.) Cav. An. Hist. Nat. 1:115.

Polypodium trifoliatum Linn., *Aspidium trifoliatum* Sw.

Fronds usually pinnatisect; segments 1–2-jugal, the terminal more or less tripartite, the lateral 2–3-partite, one or more of the lower divisions abortive and the other abnormally extended, all more or less wavy-margined; main veins evenly pinnate, veinlets in a loose network with free appendages. Sori serial along the veins or scattered in the junction of two veinlets; indusium superior, circular, peltate, the margin wavy and finally rolling inward to form a square; sporangium finely anastomose-veined; spores phaseoloid, with four transparent, erose margined wings.



In our specimens the fronds are very variable, passing from hastate-entire, through sinuate-cleft and trilobate forms, to a large pinnately 5-sect form with all the segments 3-sect.

Hab.—Rocky walls of cenotés, in shady, damp, cool situations: Cenoté of Santa Ana, Valladolid, *Schott 732, 780, 782;* Cenoté de Cafetal, Chichen Itza, Jan. 18, 1895, *Millspaugh Armour Exped., 132, 133;* in a large cave at Buena Vista Xbac, *Gaumer 994;* and in a cave near Calcehtoh, *Stone 261.* In fruit from November to March.

ASPLENIUM.

Sori oblong and lengthwise of the oblique veins above their base and below their summit; indusium lateral, inserted along the inner side of the fertile vein, and decurrent along it. Veins free.

Asplenium pumilum Sw. Fl. Ind. Occ. 1610.

A. heterophyllum Presl.

Frond pinnately 3-many partite, deltoid in general outline, the lower segments petiolate, more or less 3-lobed, the others sessile and decurrent, all irregularly crenate-dentate and slightly ciliate beneath with sagittate hairs. Sori on the secondary veins oblique to the midribs of the segments; indusium scaphoid, the free margin erose and

sagittate-ciliate; sporangia many, slightly veined; spores ovoid to phaseoloid, opaque, and reticulately invested with the remains of the transparent, placentoid membrane.

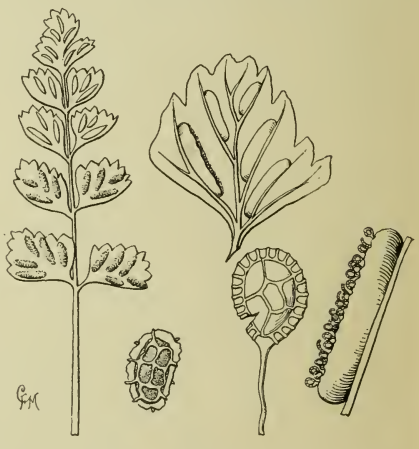
The plant is called ZIZTALCHEN, "Refrigerant," by the Mayas, who use several species of ferns as cooling applications in fever conditions.

Hab.—Shady places, in sand, under the edges of rocks, and in crevices of the walls of cenotés: Merida, at the Quinta del Obispo, *Schott 11;* Cedral, Cozumel, Jan. 5, 1895, *Millspaugh Armour Exped., 35, 36;* at the cenoté of Xcholac, *Gaumer 543;* and near San Miguel, Cozumel, *Millspaugh Pl. Utowanæ 1485.* In the Cozumel specimens the fronds are taller than is usual, the upper portion being more elongated than in the type, and deeply pinnatifid to the acuminate apex, with the lobes more or less deeply cut, but not laciniated. Quite unlike in appearance the smaller, normally deltoid, forms of the mainland, with entire, or nearly entire upper third, but otherwise the characters are the same. The species, however, like all other Asplenieæ, is an extremely varied one, and the Cozumel forms are no greatly marked exceptions.

Asplenium dentatum Linn. Sp. Pl. 1540.

A. pygmæum Linn. in part.

Fronds linear-oblong, pinnatisect; segments mostly opposite, 8–12-jugal, sub-distant especially below, cuneate-elliptical, blunt, more or less sharply serrate-dentate above; veins simple, or the lowest pair forked at the apex. Stipes lax, green-margined especially above. Sori oblong, scaphoid, 3–5 on each segment, arranged on the inner margin of each of the oblique veins, the free margin erose-denticulate; sporangia many, heavily anastomose-ridged; spores phaseoloid, anastomosely ridged and winged by the remains of the hyaline placentoid membrane.



Fertile fronds 14–20 cm. long, sterile about 6 cm. Our specimens appear depauperate when compared with the large plants of this species from Jamaica, and the Isle of Pines.

Hab.—At the Cenoté de Telchaguillo, *Schott 747.*

HEMIONITIS.

Fronds cordate, entire, or palmately cleft or parted. Sori naked, reticulated, continuous upon the whole loose network of veins.

Hemionitis palmata Linn. Sp. Pl. 1535.

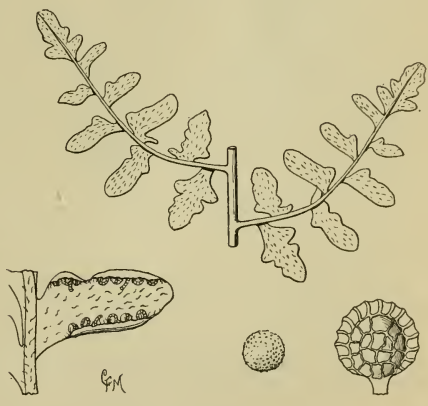
Gymnogramme palmata Lk.

Fronds more or less palmately cleft into three lobes, the uppermost lanceolate, entire, the lateral lanceolate and auriculate at the base, causing the frond to appear 5-lobed; rusty-pilose, especially along the margins beneath and on the upper third of the long stipe. Segments irregularly large crenate-dentate. Sori naked, lineal-continuous, covering the entire venous system of the frond; sporangia nearly sessile, reticulately broad-veined; spores globular or nearly so, transparent, densely papillate. Stipes 10–18 cm., fertile fronds 4–7 cm. In full fruit from November to March.

Hab.—In dense forests. So far only found at one station: the dense forests of Buena Vista Xbac, where it is reported as being common, *Gaumer 1072*.

PELLÆA.

Sori in elongated clusters at the upper ends of the free veins, usually so confluent as to appear continuous, and commonly covered by a broad, membranaceous, continuous or interrupted general indusium consisting of the altered and reflexed margins of the fertile segments.



Pellæa aspera (Hook.) Baker, Syn. Fil. 148.

Cheilanthes aspera Hooker.

Stipes shining-purple, woolly-hairy above. Fronds elongated, slender, pinnately divided, the pinnules alternate; segments oblong-deltoid, blunt, the larger irregularly bilobate at the base and crenate above, the smaller and terminal crenate, all strigose-hairy above and beneath.

Sori contiguous under the continuous marginal indusium, which does not include the blunt apex, nor the entire base; sporangia nearly circular in outline, and marked by anastomosing ridges; spores globular or nearly so, hyaline, papillate.

Stipes fasciculate from a rusty-woolly rootstock; 10–35 cm. long. This species, together with Cheilanthes microphylla, is commonly known among the Yucatecs as "HELECHO," the family appellation of the ferns, and is used in domestic practice as a refrigerant in fevers and inflammations.

Hab.—Dry situations, in open lands: Near Merida, *Valdez 65;* and Chichankanab, *Gaumer 1473.*

CHEILANTHES.

Fronds chaffy or woolly, 2–3-pinnate. Sori distinct or contiguous, borne on the thickened ends of the free veinlets and covered by a commonly whitish, membranaceous, more or less continuous common indusium, formed of the reflexed and altered margin of the segment.

Cheilanthes microphylla (Sw.) Sw. Syn. Fil. 806.

Adiantum microphyllum Sw.

Stipes wiry, glabrous. Fronds pinnatisect, the rachis and segments rusty-puberulous, the latter especially beneath; segments serrate-pinnatifid, blunt, the ultimate subentire. Sori more or less interruptedly confluent, the margin indusiate, formed of the revolute and altered crenations of the lobes; sporangia pyriform, the surfaces finely and closely reticulate-veined; spores globose, hyaline, slightly and finely papillate.

Plants 8–30 cm. high; fronds 5–20 cm. long, 6–8 cm. broad. In fruit throughout the year.

Hab.—Crevices of walls, and on rocks in dry situations: Merida, and the ruins of Uxmal, *Schott 686;* walls of cenotés and of dwellings near Izamal, *Gaumer 533,* and San Anselmo, *1238, 1266, 1409;* throat of an open well, Izamal, *Stone 253.*

Cheilanthes leucopoda Lk. Sp. Fil. 66.

C. glandulifera Liebm.

Fronds canary-yellow, terminal on the stipe, ovate in general

outline, tripinnatisect, the segments small, blunt, and deeply crenate-lobed, all recurrent on the hairy rachides, and hairy especially beneath.

Sori more or less distinct; indusia interrupted, membranaceous, formed of the recurved crenations of the ultimate segments; sporangia more or less circular, finely and closely anastomose-veined; spores globular, completely invested with a network of irregularly anastomosing prominent ridges.

Stipes 6–12 cm. long; fronds 8x8 cm.

Hab.—Rich cool woods. So far this species is only known in our range through a specimen collected by *Dr. Gaumer* on the island of Cozumel in 1885.

ADIANTUM.

Stipes black and polished. Sori marginal, short, borne on the under side of a transversely oblong, semilunar, or roundish, more or less altered margin or summit of a segment lobe, which is reflexed to form an indusium. Main rib of the segment none, or obscure at the lower margin.

Adiantum tricholepis Fée, Gen. Fil. 107.

Rootstock short, stout and scaly. Stipes black, polished. Fronds 3–4-pinnate, ovate in general outline; segments small, numerous, roundish-rhombic, the ultimate mostly 3-crenate; all hairy on both sides but especially on the strongly marked veins beneath. Marginal indusia usually 3 on each segment, hairy; sporangia coarsely anastomose-ridged; spores triangular, the sides concave, each with a central hyaline globule and a transparent three-forked line connecting the angles.

The apex of the frond shown in the cut is natural size. Stipes 7–18 cm. long; fronds 20–30 x 16–28 cm. The Yucatec name for the Adiantums, Culantrillo, answers to the English "Maiden-hair." Both species are used indiscriminately by the people

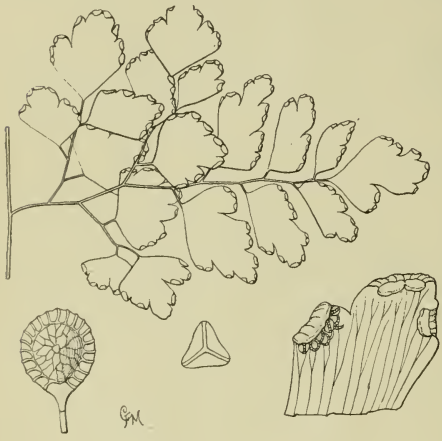
as refrigerants, especially in gonorrhœa in which trouble they are said to prove highly beneficial.

Hab.—Shady, cool situations, particularly at the mouths of caves. Ruins of Uxmal, *Schott 687;* mouth of the cave of the Great Mound at Izamal, Jan. 13, 1895, *Millspaugh Armour Exped. 54*, and on the north aspect of the Monjas, Chichen Itza, Jan. 17, 1895, *112;* Izamal, Jan., *Gaumer 386*, and in patches on large stones in deep woods at Calotmul, *1725*, and Chichankanab, *1723*, *1724;* near Merida, *Valdez 64;* and in a cave near Calcehtoh, *Stone 263*.

Adiantum tenerum Sw. Fl. Ind. Occ. 1719.

A. trapezoides Fée.

Stipes shining, glabrous. Frond 3–4-pinnate; segments membranaceous, glabrous, obliquely rhomboid, blunt at the apex, more or less incised into 3–5 partial lobes at the free fertile margins, and jointed to the pedicels; veins filiform, once to twice forked. Sori marginal beneath the recurved dentations of the apex, which form small, oblong indusiæ; sporangia nearly circular, jointed to the pedicel, closely and finely anastomose-reticulate; spores triangular with slightly concave sides, the angles connected by a three-forked hyaline ridge.



The pinnule in the cut is natural size. Stipes 12–45 cm. or often a full meter in length. In fruit throughout the dry season, from November until March.

Hab.—Mouths of caves, walls of cenotés, and on rocks in cool, shady woodlands. Merida, Quinta de Encalada, *Schott 92*, and the Cenoté of Kikil, *778;* mouth of a cave near Izamal, *Gaumer 1071*, and in deep woods at San Anselmo, *2140*, *2442*, and Chichankanab, *1516*.

PTERIDIUM.

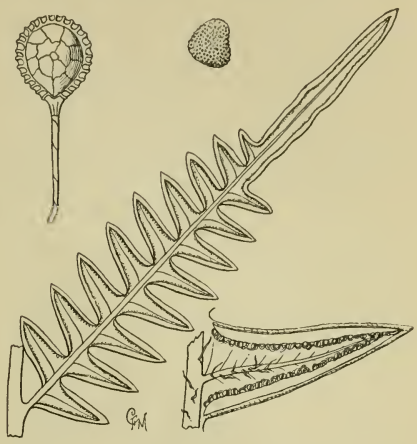
Fronds once to twice pinnate, or decompound. Sori a complete continuous slender line occupying the entire margin of the fertile segments and covered by their recurved narrow edge which forms an uninterrupted, membranaceous indusium, attached to a continuous transverse vein-like receptacle, connecting the tips of the forked and free veins.

Pteridium caudatum (L.) Maxon.

Pteris caudata Linn.

Fronds pale yellow-green, stiff and ligneous, 3-pinnatisect; segments elongate-deltoid, blunt, or in fruit often acute, the ultimate segment about one-third the length of the pinnule, all oblique at the shortly decurrent base, and scattered lax-hairy along the midrib.

Sori forming a complete line on each margin of the segment from the base to and including the apex; indusial membrane thin, about one-quarter the breadth of the segment; sporangia long pediceled, the pedicel twisted and jointed at the apex; spores conoidal, the apex blunt, the base slightly emarginate, the surface completely invested with rounded verrucæ.



Plants large and bushy. Stipes 30–40 cm. long. Fronds 30–40 x 25–30 cm. In fruit from November to March. The plant is called X-ual-kanil, "Yellow Fly-brush," by the Mayas, who use fascicles of the fronds bound together by their stipes as whisks to drive away flies.

Hab.—Dry, open spots in woodlands. Island of Cozumel, *Dr. Gaumer 1885;* and near the center of the island, *Millspaugh, Pl. Utowanæ 1551, 1565.* Not known on the Peninsula.

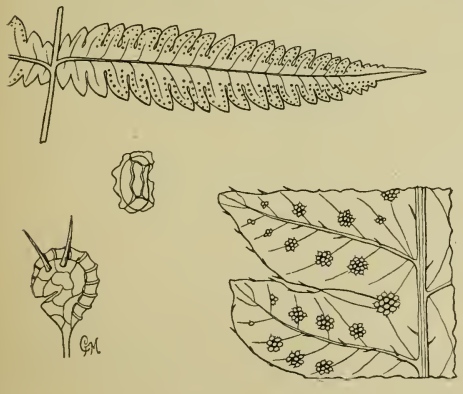
POLYPODIEÆ.

Rootstock creeping, branched, often chaffy-scaly, bearing scattered roundish knobs from which the stipes arise from a distinct articulation. (Except in § *Phegopteris*, in which the stipe is continuous with the rootstock.) Sori round, naked, arranged in distinct rows on each side of the midrib or the main straight veins, or irregularly scattered, each borne on the apex or back of a vein.

Goniopteris tetragona (Sw.) Presl.

Polypodium tetragonum Sw.

Frond pinnatisect; pinnules lanceolate, the lower pinnatifid for at least one-third their length, shortly petiolulate; segments slightly scattered-hairy, oblong, falcate, blunt or bluntish, entire; veinlets free, the lowest pair meeting below the sinus. Rachis 4-gonal. Sori serial along the veins, midway of the veinlets, and an odd larger one at the sinus; sporangia pyriform, slightly anastomose-veined and bearing 1–2 aciculate hairs at or near the apex; spores phaseoloid, partially invested by transparent, anastomosing wings.

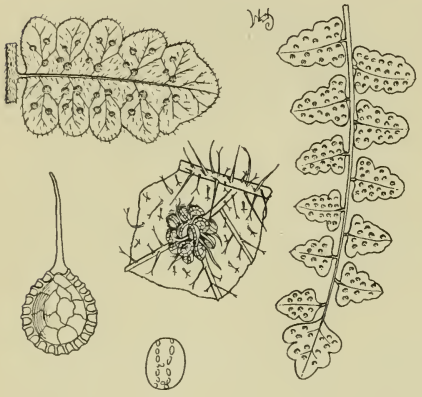


Stipes 25–50 cm. long. Fronds 25–30 x 16–19 cm., fruiting pinnules 2 x 9 cm.

Hab.—Rocks and rock walls in cool situations. Cenoté de Sacalun, *Schott 631;* common on the walls of a cenoté twelve miles east of Izamal, *Gaumer 995;* and on the north wall of a dwelling on the outskirts of Izamal, *Millspaugh, Pl. Utowanæ.* This fern is also occasionally seen in cultivation, *Gaumer 993.*

Goniopteris reptans (Sw.) Presl.

Polypodium reptans Sw., *Aspidium reptans* Mett.



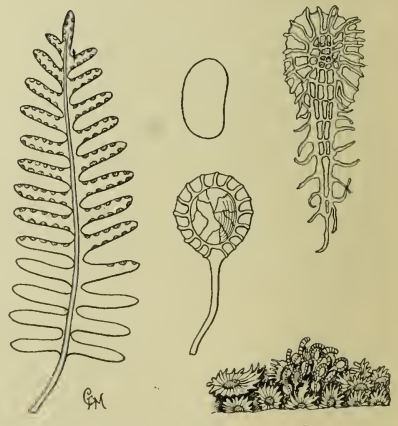
Frond pinnatisect, stellate-hairy above, lax 2–3-forked-hairy beneath; segments alternate, ovate, blunt, more or less regularly crenate or repand, subtruncate at the short petiolulate equal base; veinlets simple, the lowest pair anastomosing and projecting a veinlet to the sulcus; rachis filiform. Sori scattered, 3–5 to each segment; sporangia lightly anastomose-veined; spores ovoid to phaseoloid, marked by two lines of distinct beads passing around the longitudinal axis.

Fronds 14–22 cm.; segments 1.5–2.3 x 1.3–1.5 cm. Plants cæpitose or decumbent.

Hab.—Moist rocks, in shady places. Cenoté of Uayama, *Schott 779;* in a cave near Calcehtoh, *Stone 264.*

Polypodium polypodioides (L.) Hitch. Pl. Baham. 156.

Acrostichum polypodioides Linn., *Polypodium incanum* Sw., *Marginaria incana* Presl, *Lepicystis incana* Sw.



Fronds low, the stipes rising from a slender, scaly, running rootstock, coriaceous, grayish beneath from a dense covering of scurfy, peltate, laciniate scales; simply pinnatifid, the segments oblong-linear, obtuse. Sori small, situated in deep pits near the margin of the segments. (These pits are readily seen with the naked eye, after scraping off the scales.) Sporangia nearly circular in outline, finely few-anastomose-veined; spores phaseoloid, hyaline, unmarked.

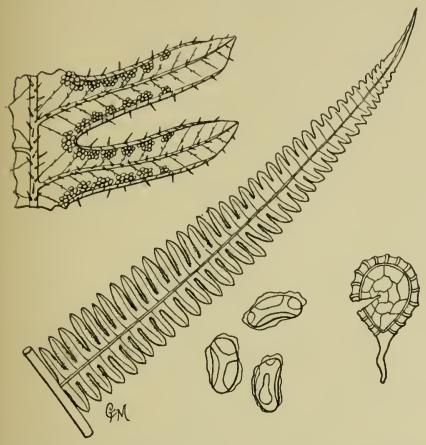
Stipes 3–6 cm. Fronds 6–10 x 2.5–3 cm.

Hab.—On trees, in deep woods, infrequent: On the branches of Lysiloma latisiliqua, at Buena Vista Xbac, *Gaumer 1110.*

Phegopteris rudis Fée.

Polypodium rude Kunze., *Alsophila pilosa* Mart. & Gal.

Fronds pinnatisect; pinnules sharply lanceolate, the lower pinnatifid for at least one-half their length, hairy beneath, especially on the midrib and veins; segments ligulate-falcate, acute or acutish, entire; veinlets free, the lowest pair not meeting at the sinus. Rachis terete. Sori contiguous at the ends of the veinlets where the margins of the segments are half revolute but in no sense indusiate; sporangia pyriform, finely anastomose-veined, not aciculate haired; spores phaseoloid, slightly interrupted-winged, and broadly few-anastomosed by the hyaline placentoid membrane.

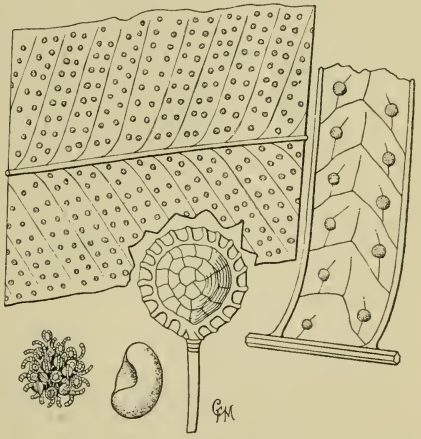


Hab.—Shady, cool places on rocks. This species, while belonging naturally to this region, must be quite infrequent, as the only specimen so far collected is an immature frond gathered by *Dr. Schott*, at the Cenoté of Sacalun. (Herb. Field Col. Mus. No. 59161.)

Campyloneuron Phyllitidis (L.) Presl.

Polypodium Phyllitidis Linn.

Frond rigid, chartaceous, glabrous, oblong-lanceolate or oblong-linear, irregularly slight-repand, long-tapering into the stipitate or nearly sessile base; veins straight, costate; veinlets arched-transverse, 3-appendaged, the third appendage prolonged from the anastomosis of the veinlets parallel to the costæ. Sori circular in outline, arranged in regular series parallel to the costæ, and borne on the back of the lateral appendages to the veinlets; sporangia nearly circular, finely and regularly anastomose-veined; spores opaque, phaseoloid, the convexity filled with a hyaline membrane.



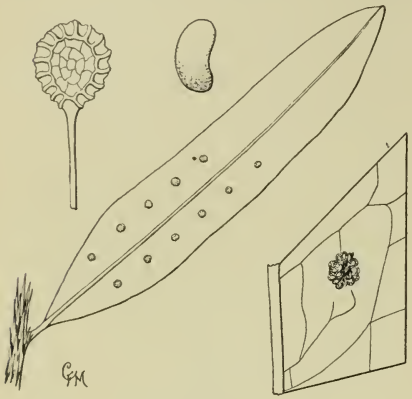
Fronds 30–70 x 5–8 cm. Rootstock nearly globular.

Hab.—On decaying trees and stumps. Cenoté of Maxcabicú, *Schott 781;* Laguna Colombia, south end of Cozumel, Jan. 5, 1895, *Millspaugh, Armour Exped. 38.*

Phymatodes lycopodioides (L.) comb. nov.

Polypodium lycopodioides Linn. Syst. Nat. 2:691.

Fronds chartaceous, alternate along the long, densely scaly rootstock, linear-lanceolate, oblong-lanceolate or ovate, blunt or acutish at the apex and tapering to a short petiolulate stipe. Veinlets 3-serial, arch-anastomose. Sori large, globular, arranged in two parallel rows one on each side of the midvein and equal distance between it and the margin; all borne somewhat irregularly on the anastomosis of several veinlets; sporangia nearly circular in outline, finely and regularly anastomose-veined; spores phaseoloid, opaque, the concave side unoccupied by a membrane.



Rootstalk .25–3 meters long; stipes about 2–3 cm. apart; fronds 6–18 cm. long, 1–2.5 cm. broad. Maya name: X-NAAB-ɔUɔ, "The Kiss of the Naab," probably in satirical allusion to the clinging embrace of the women of the indigenous Pueblo of Tenabo.

Hab.—Climbing the trunks of trees, in dry open woods. Cenoté of Kikil, *Schott 768;* Chichen Itza, Jan. 18, 1895, *Millspaugh, Armour Exped. 134;* "trailing ten feet, in an old field near Izamal," *Gaumer 528*, and climbing trees at San Anselmo, *1826*, and at Chichankanab, *1825;* climbing Sabal trees at the Caleta, Cozumel, *Millspaugh, Pl. Utowanæ 1534.* The specimen reported by Dr. Gaumer as trailing on open ground has very narrow, lanceolate leaves, 1.2 x 17 cm., and is in fine fruiting condition.

SCHIZAEACEÆ.

Ferns with simple or pinnate leaves. Sporangia ovoid, sessile, borne upon the under surface of altered leaflets arranged in spikes or panicles, and provided with an apical ring; dehiscence vertical, longitudinal.

ORNITHOPTERIS.

Fronds erect, commonly 3-branched, the middle branch sterile and 1–3-pinnate. Fertile fronds paniculate at the apex, divisions many, one-sided, narrow, minute. Indusia none. Sporangia attached by their sessile bases in a double row to the under side of the divisions; apical ring several rayed.

Ornithopteris adiantifolia (L.) Bernh.

Osmunda adiantifolia Linn., *Anemia adiantifolia* Sw.

Sterile leaf glabrous, usually longer than the fertile, 2–3-pinnatifid, the ultimate segments cuneate-elliptical, denticulate above, striate with many flabellate veins. Fertile leaf-segments minute, crenately 4–6-cleft. Sporangia obpyriform, the surface densely reticulate-veined; apical ring 8–12-rayed. Spores ovoid, the surface marked by several prominent ridges convergent at the base and apex.

Plants 12–40 cm. high, the sterile leaf 15–24 cm., inferior segments 1–1.5 cm. In fruit at all seasons.

Hab.—On limestone rocks in shady places. Ruins of Uxmal and Mayapan, *Schott 651;* the Great Mound at Izamal, Jan. 13, 1895, *Millspaugh*, *Armour Exped. 58;* and *Gaumer 372;* woodlands near Chichankanab, *Gaumer 1408*, *1458*, *1716*, Pocoboch, *2382;* deep woods, center of the Island of Cozumel, *Millspaugh*, *Pl. Utowanæ*, *1563*.

Ornithopteris cicutaria (Ktze.) Underw. Mem. Torr. Club 12:15.

Anemia bipinnata Moore.

Sterile leaf once to twice shorter than the fertile, 2–3-pinnatifid, the ultimate segments cuneate, irregularly incised and wavy-margined, with a few scattered lax, aciculate hairs upon the under surface. Fertile leaf-segments minute, about 4-crenate, the edges involute; sporangia obpyriform, the surface closely and prominently reticulate ridged, apical ring about 8-rayed, spores cordate-triangular, the surface finely papillate.

Plants 6–12 cm. high, the sterile frond 2.5–4 cm. Inferior segments 5–8 mm. In fruit at all seasons.

Hab.—On rocks, near aguadas and cenotés. Cenoté of Uayma, and Ya Uoil, *Schott 677*.

Ornithopteris Wrightii (Baker) comb. nov.

Anemia Wrightii Baker Syn. Fil. 435.

Slender, sterile leaf about one-half the length of the fertile, segments more narrowly cuneate than in the preceding species, the incisions more blunt and the scattered hairs more strict. Sporangia globose, the surface openly and quite regularly reticulate ridged; ring about 12–14-rayed; spores cupuliform, the surface finely papillate.

Plants slender and somewhat lax, 20–30 cm. high, the sterile frond 6–8 cm. long; ultimate lower segments .8–1.2 cm. long. In fruit in February.

Hab.—Limestone boulders, in open moist woodlands, near the center of the Island of Cozumel, *Millspaugh, Pl. Utowanæ 1564.*

SPERMATOPHYTA.

GRAMINEÆ.*

CHARLES F. MILLSPAUGH AND AGNES CHASE.

Herbaceous or rarely woody plants. Flowers without a distinct perianth, perfect or unisexual, solitary or several together in spikelets, which are arranged in spikes, racemes or panicles, and which consist of a shortened axis (*rachilla*) and 2 or more chaff-like, distichous, imbricated bracts (*glumes*), of which the first 2 (rarely 1, or more than 2) are empty (*empty glumes*); in the axil of each of the succeeding bracts (*floral glumes*) is, normally, borne a flower; flower sometimes wanting, the glume then being termed a sterile glume ("*flos neuter*" of the older authors). Opposed to each floral glume, with its dorsum toward the rachilla, is a 2-nerved bract (*palea*), these together forming the *fruiting glumes*, which in the *Paniceæ* and some others form an indehiscent covering about the enclosed free grain (true seed), a caryopsis rich in albumen. Stamens usually 3 (6 in GUADUA), with slender filaments and 2-celled versatile anthers; pistil with a 1-celled, 1-ovuled ovary, with 2, usually plumose, stigmas.

Rachilla articulated below the empty glumes, spikelets falling from the pedicel entire or together with certain joints of the rachis at maturity. Spikelets 1-flowered (or rarely a lower imperfect flower):

- Fruiting glumes hyaline, empty glumes indurated, spikelets in racemes or spikes whose articulate axes break up at maturity:
  - Spikelets monœcious, pistillate spikelets enclosed in a bony involucre below the staminate panicle — *Coix.*
  - Spikelets heterogamous, or all perfect, in pairs at the joints of the rachis, 1 sessile, 1 pedicellate:
    - Joints of the rachis greatly thickened and excavated for the reception of the perfect spikelets — *Hackelochloa.*
    - Joints of the rachis not thickened nor excavated:
      - Spikelets all perfect — *Saccharum.*
      - Spikelets heterogamous:
        - Grain elongated, terete — *Andropogon.*
        - Grain oval, dorsally compressed — *Sorghum.*
- Fruiting glumes membranaceous, spikelets in groups surrounded by a pseudo-involucre formed by the connate indurated first glumes of each, falling off entire — *Anthephora.*

*The cuts present a portion of the inflorescence (spike, raceme or panicle) or a single spikelet magnified 5 diameters (except where noted natural size in COIX and OLYRA); the fruiting glumes and grain magnified 10 diameters, and a transverse section of the latter at its greatest diameter, the base of the section being the ventral side—*i. e.*, the side bearing the hilum.

Fruiting glumes indurated, empty glumes thin or membranaceous; spikelets in racemes or panicles, falling from the continuous rachis at maturity:
- Spikelets perfect:
  - Sunken in cavities of the broad flattened axis — *Stenotaphrum.*
  - Not sunken in the axis:
    - Subtended by an involucre of 1 to many bristles:
      - Spikelets falling, bristles persistent:
        - Empty glumes auricled and lyre shaped — *Setariopsis.*
        - Empty glumes not auricled nor lyre shaped — *Chætochloa.*
      - Bristles falling with the spikelets — *Cenchrus.*
    - Not subtended by bristles:
      - Empty glumes awned — *Oplismenus.*
      - Empty glumes not awned:
        - Floral glume auricled at base — *Ichnanthus.*
        - Floral glume not auricled at base:
          - Inrolled over the palea:
            - Spikelets in unilateral racemes — *Paspalum.*
            - Spikelets (except Panicum paspaloides) not in unilateral racemes — *Panicum.*
          - Not inrolled — *Syntherisma.*
- Spikelets monœcious, pistillate above, staminate below in the same panicle — *Olyra.*

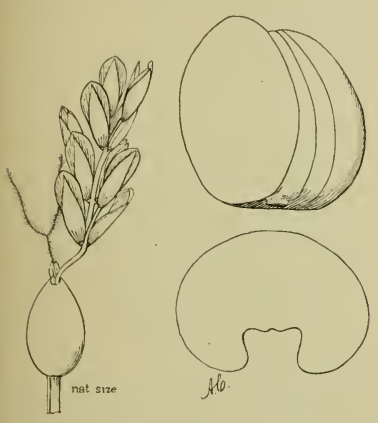
Rachilla articulated above the empty glumes so that these remain after the fall of the fruiting glumes. Spikelets 1 to many flowered:
- Spikelets in 2 rows on 1 side of a continuous rachis forming unilateral spikes or racemes:
  - With 1 perfect flower, often a staminate or neuter flower above it:
    - Awnless — *Cynodon.*
    - Awned:
      - Spikes digitate at the summit of the culm — *Chloris.*
      - Spikes racemed — *Bouteloua.*
  - Two to several flowered:
    - Sessile, crowded in closely imbricated spikes:
      - Rachis with terminal spikelets — *Eleusine.*
      - Rachis extended in a naked point — *Dactyloctenium.*
    - Pediceled in spike-like racemes — *Leptochloa.*
    - Pediceled on one side of the branches of a spreading panicle — *Gouinia.*
- Spikelets not disposed in unilateral spikes, usually paniculate (solitary or in pairs in Monanthochloë):
  - One-flowered:
    - Floral glume indurated, awned — *Aristida.*
    - Floral glume thin membranaceous, awnless — *Sporobolus.*
  - Two to many flowered:
    - Perfect:
      - Spikelets (except empty glumes) densely clothed with long hairs, equalling or exceeding the glumes:
        - Floral glume hairy, rachilla naked — *Arundo.*
        - Floral glume naked, rachilla hairy — *Phragmites.*
      - Spikelets glabrate or with short hairs only:
        - Floral glume bidentate, cuspidate — *Triodia.*
        - Floral glume entire, not cuspidate — *Eragrostis.*
    - Diœcious:
      - Spikelets solitary or in pairs, sessile in the axils of the rigid upper leaves — *Monanthochloë.*
      - Spikelets in contracted panicles — *Distichlis.*
      - Spikelets fascicled, cylindric, 3 or more cm. long — *Guadua.*

COIX L. Gen. Pl. 1043.

Spikelets monœcious, the staminate above, panicled, projected out of the orifice of the bony involucre, the pistillate below, enclosed by the ovate or spherical ivory-like sheath of the subtending bract. Stamens 3.

Coix lachryma-Jobi L. Sp. Pl. 972.

Inflorescence of 1–5 spikes exserted at maturity; peduncle angled, glabrous. Staminate spikelets 1 or 2-flowered, flattened dorsally, in 2's or 3's, one pedicellate, 4–5 x 10 mm.; first glume obovate, obtuse, 2-nerved, the nerves broadly winged above, margin of the glume inflexed; second glume slightly shorter, ovate, acute, 6-nerved; floral glumes 9 mm., ovate, hyaline, 3-nerved; palea equal, hyaline except base which is membranaceous. Pistillate spike of 1 fertile and 1 or 2 sterile spikelets enclosed by the ovoid or spherical ivory-like sheath of the subtending bract, 7 x 12 mm. Apex of linear, firm sterile spikelets projecting from orifice of capsule. First glume of fertile spikelet, 11 mm. long, orbicular, apiculate, hyaline except apex and margins which are tough membranaceous, 11–13-nerved, the margins inflexed; second glume equal to first in length, broadly ovate, apiculate, wing keeled, hyaline, with membranaceous apex and keel; third glume similar with a faint midnerve; floral glume 9 mm., apiculate, 3-nerved; palea 7 mm., 2-nerved, delicately hyaline. Grain reddish brown, sub-globose, with a broad sulcus down the ventrum, 5 x 5.5 mm., in section ungulanotarate (hoof-print shape).



Hab.—Collected in the patio of Dr. Gaumer, Izamal, Jan. 13, 1895, *Millspaugh Armour Exped. 73;* "Izamal, one plant came up spontaneously in my yard in 1894 and produced a quantity of seed; this was followed in 1895 by several plants springing up in the same place and producing a great quantity of seed, but none came up in 1896," *Gaumer 1031.*

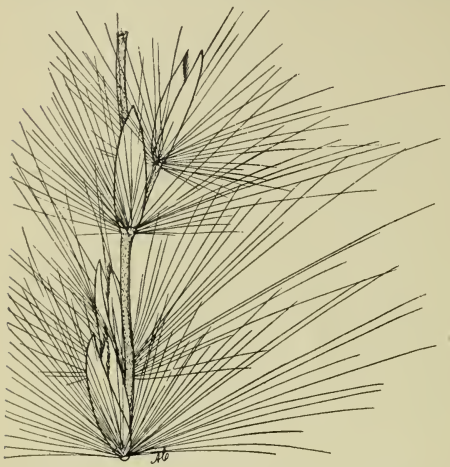
SACCHARUM L. Sp. Pl. Ed. 2, 1:79.

Inflorescence a much branched panicle with an elongated main axis. Spikelets 1-flowered, in pairs at each joint of the articulate rachis, 1 sessile, 1 pedicellate. Empty glumes indurated, with long hairs at the base and on the callus, floral glume hyaline or wanting. "*Caryopsis oblonga*" (Benth. & Hook. Gen. Pl. 3:1125). Stamens 3.

Saccharum officinarum L. Sp. Pl. Ed. 2, 1:79.

Panicle exserted, 30–60 cm. long, 15–25 cm. wide, axis terete,

pubescent; primary branches fascicled, pilose at the base; racemes slender, many jointed, rachis puberulent, pilose at the base, internodes 5–8 mm. Spikelets all perfect, .8 x 3.2 mm., densely pilose at the base with white spreading silky hairs twice the length of the spikelets. Empty glumes 2, lanceolate, acute, scabrous above, first 4-nerved, second 3-nerved (lateral nerves often obscure), ciliate above; floral glume 2.5 mm., oblong-ovate, acute, 1-nerved, ciliate; palea minute or wanting. Grain not seen.



Hab.—Yot Donot, *Gaumer 1323*, Calotmul *2307*.

"For culture, varieties are chosen which have been reproduced for centuries by cuttings, and consequently have become nearly incapable of blooming." (Hackel's "True Grasses," translated by F. Lamson-Scribner, p. 50.)

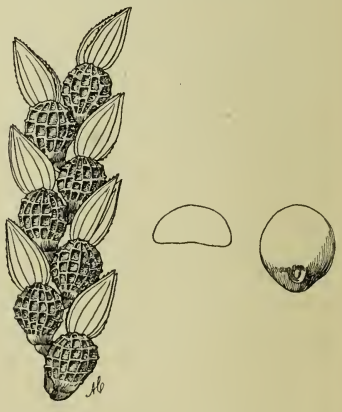
HACKELOCHLOA Kuntze Rev. Gen. Pl. 2:776.

Inflorescence of spike-like racemes. Spikelets heterogamous, in pairs, partially imbedded in the excavations of the articulate rachis, one sessile, perfect, 1-flowered, the other pedicellate, staminate or neuter, the pedicel grown to the rachis. Glumes of the perfect spikelet 4; the first indurated, globose, and covering the cavity in the rachis. Grain ovoid. Stamens 3.

Hackelochloa granularis (L.) Kuntze Rev. Gen. Pl. 2:776.

Cenchrus granularis L.

Inflorescence of 2–4 spike-like racemes, in leafy panicles, more or less included. Racemes 12–20 mm. long, 2.5 mm. wide, often exceeded by the subtending leaf. Internodes of the rachis 1 mm. long, brown or black; scabrous. Pediceled spikelet fuscous, scabrous, 2 mm.; first glume ovate, flattened dorsally, 7-nerved, the lateral nerves hispid; second glume scaphoid, 7-nerved, the keel hispid; third and fourth shorter, hyaline, sometimes with a staminate flower, usually empty. Perfect spikelet globose, 1.6 mm., first glume light brown turning cinereous black in maturity, faveolate and granular; second of equal length, less rigid, white, oval, 1-nerved with a thickened margin, immersed in the cavity of the rachis; third



shorter, hyaline, 2-nerved; floral glume about equal and similar, subtending a minute hyaline palea. Grain pinkish white, broad ovoid, 9x1 mm.; in section plano-convex; endosperm oily.

Hab.—San Felipe, "18 inches, common," *Gaumer 1404*, Pocoboch, *2378*, Chichankanab, *2465*.

ANDROPOGON L. Sp. Pl. 1045.

Inflorescence of spike-like racemes. Spikelets heterogamous, in pairs at each joint of the articulate rachis, one sessile, perfect, 1-flowered, the other pedicellate and either staminate, neuter, or reduced to the pedicel. Glumes of the perfect spikelet 4; first indurated, flattened dorsally, with a strong nerve near each margin; floral glume hyaline, awned, palea hyaline, minute or wanting. Grain elongated. Stamens 3.

Spikelets awned:	
Clothed with soft hair	*hirtiflorus.*
Hairy only at base	*semiberbis.*
Spikelets awnless	*Nardus.*

Andropogon hirtiflorus (Nees) Kunth. Rev. Gram. 2:569.

Schizachrium hirtiflorum Nees.

Racemes single, 4–5 cm. long, on glabrous included peduncles. Internodes of rachis 6 mm. long, purple, clavate, with a toothed cup-like appendage at the apex, densely silky pilose. Neuter spikelet consisting of a green, 3-hispid-nerved, slender awned glume enclosing a hyaline 1-nerved empty glume; pedicel shorter than sessile spikelet, silky pilose. Perfect spikelet elliptic, 7 mm. long, with a ring of white hairs at the base. First glume purplish, bidentate, 5-nerved, the lateral pair strongest and hispid above, densely pilose; second equal in length, scabrous, light brown with a green, hispid keel; third purple, hyaline, 2-nerved, ciliolate; floral glume nearly equal in length, ciliolate, cleft ⅔ its length, bearing a scabrous, geniculate awn, 12–13 mm. long; palea wanting. Grain purple, lanceolate-ellipsoid; tipped with the style base, .6x4.5 mm.; in section, depressed sub-orbicular.

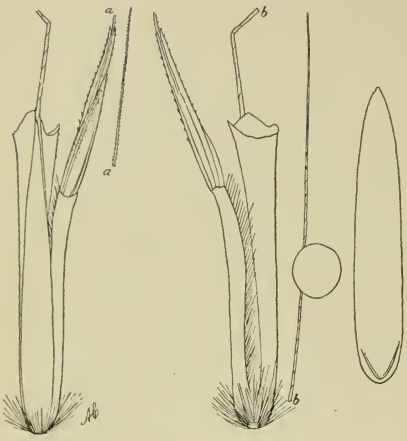
Hab.—In old fields, 3 feet high, Tekax, Sept. 1895-96, *Gaumer 1134*.

Andropogon semiberbis (Nees) Kunth. Enum. 1:489.

Schizachrium semiberbe Nees.

Racemes single, 4–6 cm. long, on slender glabrous included peduncles. Internodes of rachis 8 mm. long, tinged with red, clavate, with a toothed cup-like appendage at the apex; a ring of white hairs

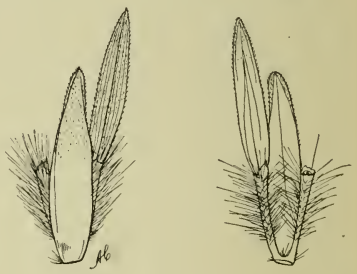
at the base, otherwise glabrous. Neuter spikelet reduced to a 5 nerved, scabrous, awned glume on a broad ciliate pedicel shorter than the sessile spikelet. Perfect spikelet lanceolate, 8 mm. long, with a ring of short white hairs at its base. First glume brown, bidentate, 2-nerved, scabrous, nerves hispid above; second equal in length, brown, acute, keeled, scabrous, ciliate; third white, hyaline, 2-nerved, ciliate; floral glume ½ the length of first, cleft ⅔ its length, bearing a scabrous geniculate awn, 15–18 mm. long; palea wanting. Grain light brown, translucent, lanceolate-ellipsoid, .7 x 3.9 mm.; in section compressed sub-orbicular.



Hab.—"Abundant on stone walls, house roofs and on the ancient ruins about Izamal, rare in fields, 2 feet high," Nov., *Gaumer 1037*.

Andropogon Nardus L. Sp. Pl. 1482.

Racemes 1–1.5 cm. in pairs, terminal upon the culm or its branches, one sessile, with one or two basal homogamous pairs (of 2 staminate spikelets), the other short pediceled, both subtended by a red-brown sheathing leaf 1.5–2 cm. long, arranged in a false panicle interrupted by leaves. Internodes of rachis 2 mm., clavate, with a toothed cup-like summit, densely pilose with rather stiff white hairs, 1–2 mm. long. Staminate spikelet 4.5 mm., russet brown, lanceolate; first glume, scabrous, 9-nerved; second glume nearly equal, 3-nerved; floral glume 3.5 mm., linear lanceolate, hyaline, subtending a staminate flower without palea. Perfect spikelet 5–5.3 mm., light brown, lanceolate; first glume acute, scabrous, the 2 nerves winged; second equal, acute, 1-nerved; third 3.5 mm., white, hyaline, 1-nerved, scabrous; floral glume 3 mm., linear, hyaline, awnless; palea wanting. Grain not seen.



Hab.—Cultivated, Hacienda San Rafael Xteppen, Aug. 7, 1865 (lacking inflorescence), *Schott 547*; "Cultivated at Merida on account of its pleasant odor, and used in Yucatec domestic medicine as a tea for stomachic colic," *Valdez 43*.

SORGHUM Pers. Syn. 1:101.

Inflorescence paniculate, racemes reduced to 1–4 joints, spikelets heterogamous, in pairs at each joint of the usually articulate

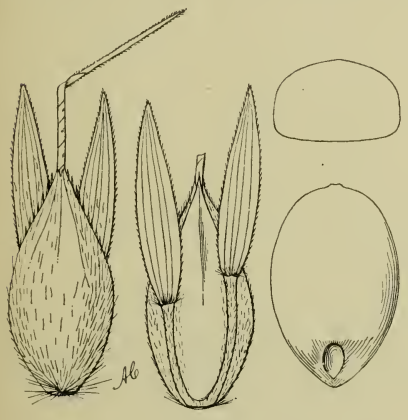
rachis, or at 3's at the terminal joint, the sessile perfect, the pedicellate staminate or neuter. Glumes of perfect spikelet 4, first and second indurated, floral glume hyaline, awned, palea hyaline, minute. Grain ovoid, dorsally compressed. Stamens 3.

Panicle loose and open	*Halepense.*
Panicle dense and contracted:	
Awn 8–10 mm., grain 3.6 mm.	*Drummondii.*
Awn 5 mm., grain 4.4 mm.	*vulgare.*

Sorghum Halepense (L.) Pers. Syn. 1:101.

Holcus Halepensis L.

Panicle long exserted, 12–30 cm. long, loose and spreading; branches sub-verticillate; axis and branches sharply serrulate-angled, densely pubescent in the axils. Racemes borne on the ultimate branches of the panicle, of 1 or 2 joints; internodes 4 mm. long, slender, densely tawny pilose. Pediceled spikelet lanceolate, 6 mm.; first and second glumes 7-nerved, acute, lateral nerves strongest and hispid above, ciliate; third glume shorter, hyaline ciliate-fimbriate, subtending a smaller similar palea and staminate flower; pedicel ½–⅔ the length of sessile spikelet, pilose. Perfect spikelet ovate, 6 mm., with a ring of tawny hairs at the base; first glume reddish brown, minutely bidentate, with a pair of hispid strong lateral nerves and 3 faint intermediate ones, tawny pilose; second of equal length and similar, apiculate; third shorter, white, hyaline, 2-nerved, ciliate; floral glume ½ the length of third, cleft ½ its length, ciliate, bearing a geniculate awn 6–9 mm. long, subtending a minute, lanceolate, fimbriate-ciliate palea. Grain reddish brown, obovoid 1.7 x 2.7 mm.; in section, oblong with convex dorsum.



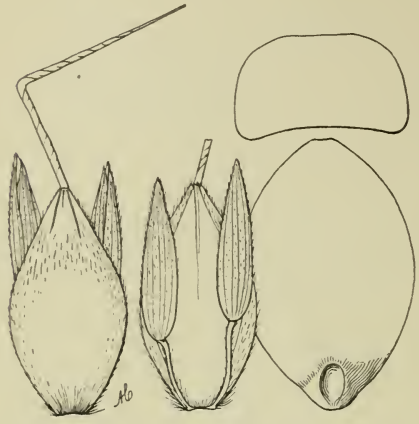
Hab.—Near Izamal, "Extensively cultivated since 1880 as a pasture grass under the name Sacate Paraná," June, 1895, *Gaumer 720, 2459,* Chichankanab *1297, 1299.*

Sorghum Drummondii Nees. ex Steud. Syn. Pl. Gram. 393.

Andropogon Sorghum Drummondii Hackel.

Panicle long-exserted, 8–12 cm. long, dense and compact; branches alternate, short, pubescent, especially in the axils. Racemes of 2–3 inarticulate joints, internodes 1–1.5 mm., pubescent. Pediceled spikelet 4–4.5 mm., lanceolate, pubescent; first and second glumes acute, 7–9-nerved, the lateral nerves strongest and hispid,

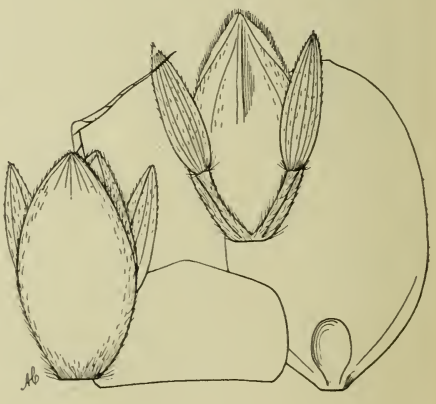
margins ciliate; third shorter, hyaline, ciliate, subtending a similar palea and staminate flower or empty; pedicel ⅓–½ the length of sessile spikelet. Perfect spikelet 6 mm., ovate, sub-acute, with a ring of hairs at the base; first and second glumes light brown to chestnut, pubescent; first 7-nerved, obtuse; second 5-nerved, apiculate, ciliate; third shorter, white or purple-blotched, hyaline, 2-nerved, ciliate; floral glume ½ the length of first, cleft ⅓ its length, ciliate, bearing a geniculate awn 8–10 mm long, and subtending a minute linear, ciliate palea. Grain reddish brown, oval, 2.4 x 3.6 mm.; in section oblong with concave ventrum and truncate-convex dorsum.



Hab.—"In an old field at Buena Vista Xbac, 3 feet high," April, *Gaumer 1053*. (*Andropogon Sorghum Drummondii* Hack. Field Col. Mus. Bot. 1:350).

Sorghum vulgare Pers. Syn. 1.101.

Panicle short-exserted, 10–12 cm. long, dense and compact; branches alternate. short, at first pubescent, becoming glabrous or nearly so, pubescent in the axils. Racemes of 1–4 inarticulate joints, internodes 2 mm. long, pubescent. Pediceled spikelet 3–4 mm., lanceolate, pubescent; first glume acute, 8-nerved, the lateral strongest and hispid, margin ciliate; second equal in length, 7-nerved, ciliate, enclosing a smaller ciliate, hyaline, empty glume; pedicel ½ the length of sessile spikelet or less, pubescent. Perfect spikelet 6 mm., ovate, with a ring of hairs at the base; first and second glumes chestnut or black and shining when mature, at first densely pubescent, becoming more or less glabrous, first 2-nerved, blunt; second 3-nerved, apiculate and having a hyaline-fimbriate margin; third shorter, white, hyaline, 2-nerved, ciliate; floral glume less than ½ the length of first, cleft ½ its length, ciliate, bearing a geniculate awn, 5 mm. long, and subtending a minute lanceolate, fimbriate palea. Grain reddish brown, oval, 2.7 x 4.4 mm.; in section oblong with slightly concave ventrum and convex dorsum.



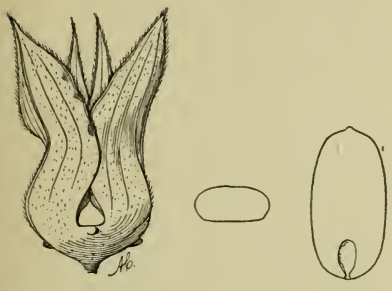
Hab.—Chichankanab, *Gaumer 2155*.

ANTHEPHORA Schreb. Gras. 2:105.

Spikelets 1-flowered, 4–5 together, each group surrounded by an indurated pitcher-shaped pseudo-involucre formed by the first empty glumes of the spikelets, connate at the base and deciduous with them at maturity. Grain oblong, free. Stamens 3.

Anthephora elegans Schreb. Gras. 2:105, t. 44.

Spike long exserted, 7–15 cm. long, pseudo-involucres 4-ranked, of 4–5 spikelets, only 1 or 2 perfecting fruit. Involucral (first) glumes 7 mm. long, pale green, ovate, acute, finely many nerved, hispid, ciliate. Spikelets 1.8 x 4.5 mm., lanceolate-ovate; second glume ⅔ the length of third, hyaline, ovate, cuspidate-acuminate, 1-nerved, hirsute; third hyaline, acute, 7-nerved, hirsute, enfolding the fruiting glumes; floral glume nearly the length of third, firmer, 5-nerved, glabrous, enfolding a similar 2-nerved palea. Grain brownish-white, oblong 1.1 x 2 mm.; in section oblong with rounded sides.



Hab.—Merida, Sept., and Hacienda San Rafael, *Schott 549;* along fences in sheltered places, 16 inches high, not common, *Gaumer 314;* in old fields, 1 foot high, common, Izamal, June to Jan., Oct., *1030,* Chichankanab *1597* and Calotmul *1644.*

SYNTHERISMA Walt. Fl. Car. 76.

Digitaria Scop. *non* Heist.

Inflorescence composed of 1-sided digitate or panicled linear racemes. Rachis 3-angled, lateral angles often broadly winged. Spikelets 1-flowered, perfect, usually in pairs. sometimes in 3's or 4's, alternate in 2 rows, rachilla articulated below the empty glumes. Glumes 3 or 4; empty glumes thin or membranaceous, fruiting glumes indurated but less so than in Panicum, papillo-striate; the floral glume with hyaline margins, not inrolled as in Panicum and Paspalum. Grain ellipsoid, dorsally compressed, enclosed within the fruiting glumes, free. Stamens 3.

Spikelets enveloped in long silky hairs	*insulare.*
Spikelets nearly glabrate or with short hairs:	
More than 3 mm., empty glumes 3	*sanguinale.*
Less than 2.5 mm., empty glumes 2:	
Lowest glume ¾ the length of spikelet, blunt, fruiting glumes chestnut	*filiforme.*
Lowest glume ½ the length of spikelet, acuminate, fruiting glumes greenish purple	*setosum.*

Syntherisma insulare (L.) comb. nov.

Andropogon insularis L. Pl. Jam. Pugill. 30.
Panicum insulare Meyer.
Panicum lanatum Rottb.
Panicum leucophæum H. B. K.
Trichachne lanatum Nees.

Inflorescence panicled, at first included, exserted when mature, of 10 to many (25–30) racemes; axis 2–10 cm. (sometimes 15–20 cm.) long, striate, glabrous below, scabrous toward the summit. Racemes erect, 3–13 cm. long; rachis 3-angled, hispidulous on the margins. Spikelets usually in pairs, the lower often abortive or wanting, 1.15 x 6 mm., lanceolate, acuminate. First glume minute, triangular, hyaline-margined, glabrous; second equal to third, lanceolate, acuminate, 5-nerved, densely clothed with long, silky, tawny hairs; third 4 mm. (excluding hairs), 5-nerved and silky pubescent like the second; floral glume nearly equal to third, chestnut with white margins, papillo-striate, acuminate; palea equal and of like texture. Grain translucent pinkish cream-white, ellipsoid, .7 x 1.8 mm.; in section unequally biconvex.

Hab.—Merida 1865, *Schott 94* (*Panicum lanatum* Rottb. Field Col. Mus. Bot. 1:353); frequent at the port of Silam, 3 feet high, April, 1895, *Gaumer 675* (*Panicum insulare* G. F. W. Meyer, Field Col. Mus. Bot. 1:288), San Anselmo *1917;* on the rocky plain south of the lagoon near Progreso, *Millspaugh Pl. Utowanæ 1681* (*Panicum insulare* (L.) Meyer, Field Col. Mus. Bot. 2:25).

That this species belongs in the genus Syntherisma rather than in Panicum is shown chiefly by the fruiting glumes which are of the form characteristic of the former, having a floral glume with hyaline margins not inrolled. The lanceolate spikelet and minute first glume are also characteristic of Syntherisma. The long, silky pubescence of second and third glumes and more loosely panicled racemes do not seem important enough to differentiate this species generically from Syntherisma. *Trichachne* Nees (Agros. Bras. 85, 1829), founded on this and allied forms, is, therefore, considered a synonym of Syntherisma. Neither can this species be placed in *Tricholæna* as by Grisebach and others, that genus having a distant first glume and a callus below the spikelet, with indurated second and third glumes and membranaceous fruiting glumes about ½ the length of second and third.

Syntherisma sanguinale (L.) Dulac. Fl. Hautes-Pyr. 77.

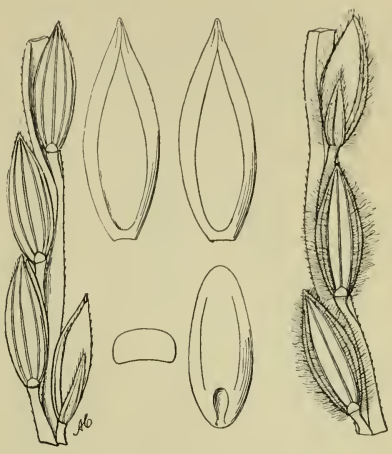
Panicum sanguinale L.

Digitaria marginata Link.

Digitaria fimbriata Link.

Inflorescence digitate or panicled, finally exserted, sometimes much so, of 2–6 racemes; axis 0–4 cm. long (usually 1 cm. or less), 3-angled, hispidulous on the margins. Racemes erect or ascending, sometimes spreading, 3–13 cm. long; rachis flexuous, broadly winged, hispidulous on the margins. Spikelets in pairs, 1.2 x 3.4 mm., oblong-lanceolate, acute. First glume minute, triangular, glabrous; second ½ the length of the spikelet, ovate-lanceolate, acute, 3-nerved, margins

and internerves pubescent with appressed hairs; third 3.4 mm., 7-nerved, the lateral ones often indistinct, margins and second internerves on each side pubescent with short appressed hairs or clothed with long silky hairs or sometimes almost glabrate, first and second nerves glabrous, scabrous or pubescent; floral glume nearly equal to third, pale brown with white margins, papillo-striate, acuminate; palea equal and of like texture. Grain translucent pinkish white, ovate-ellipsoid, rounded at apex and base, .8 x 2.1 mm.; in section convexo-concave.



Hab.—Merida, Aug. 27, 1865, *Schott 609* (*Panicum marginatum* Link *non* R. Br. *non* Vahl, Field Col. Mus. Bot. 1:353), Aug. 20, *586*, ruins of Uxmal, Sept. 16, 1865, *735* (*Panicum sanguinale* L. *ibid.*); Yucatan *loc. ignot. Gaumer 1029* (*Panicum sanguinale* L. *ibid.*), Izamal, *1034*, Chichankanab *1292*, San Anselmo *2143;* rock-strewn arid plain south of Progreso, *Millspaugh Pl. Uto. 1700.*

An extremely variable species with apparently no constant character except the fruiting glumes and the grain. After examination of a large amount of material from North and Central America and the West Indies, the forms known as *Digitaria marginata* Link and *fimbriata* Link are here included under Syntherisma sanguinale. (Kunth, Enum. 1:82, makes *D. marginata* Link a synonym of *Panicum sanguinale* L., but *D. fimbriata* Link he holds distinct.) Individual specimens can be selected showing apparently distinct species, but others show such complete intergrading that no combination of characters has been found to hold. *No. 1029 Gaumer*, from which the illustration is made, shows the two forms of spikelet, fimbriate and nearly glabrate, borne on different panicles from the same branching culm. The other distinctions: length of second glume, scabrous or smooth nerves, and size of spikelet, have not been found to hold good; spikelets of sanguinalis equaling those of *fimbriata*, excluding the long hairs of the latter. The first and second nerves of third glume are found to be scabrous usually on northern plants, but pass into the softly pubescent nerves of the southern form which is not "fimbriate"; where the internerves are pubescent the nerves are usually glabrous. *No. 19068* Herb. Field Col. Mus. Coll. C. F. Millspaugh, Morgantown, W. Va., July 30, 1890, shows spikelets with scabrous nerves of third glume and others with glabrous nerves and pubescent internerves (species sanguinalis and *fimbriata*) on the same rachis, and in one case the pair of spikelets shows one of each form. Taken altogether, however, the specimens examined show that the "*fimbriata*" form usually has a longer axis of inflorescence, panicled rather than digitate, with spreading racemes, while the typical sanguinalis

is usually digitate, but both these cases have frequent exceptions. Finally as all have, with a small variation in size only, the same fruiting glumes and grain, it seems wisest to consider all as forms of one variable species.

Syntherisma filiforme (L.) Nash. Bull. Torr. Bot. Club, 22:420.

Panicum filiforme L.

Inflorescence fasciculate-panicled, long exserted, of 4–8 racemes; axis 1–3 cm. long, striate, glabrous. Racemes erect or ascending, filiform, 4–12 cm. long, rachis somewhat flexuous, 3-angled, hispidulous on the margins. Spikelets in pairs or in 3's, .7 x 1.7 mm., ellipsoid, abruptly acuminate. First glume wanting; second ¾ the length of the spikelet, ovate with blunt apex, 3-nerved, margins and internerves pubescent with appressed, gland-tipped hairs; third slightly shorter than the floral glume, 7-nerved, the margins and first and second internerves on each side pubescent with gland-tipped hairs; floral glume 1.7 mm., chestnut with white margins, papillo-striate; palea equal and of like texture. Grain translucent creamy white, oblong with subacute base and rounded apex, .5 x 1.1 mm.; in section convexo-concave.

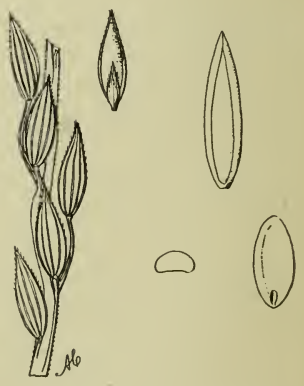
Hab —Chichankanab, *Gaumer 2250.*

Yucatan and West Indies specimens have spikelets mostly in 3's.

Syntherisma setosum (Desv.) Nash Bull. Torr. Bot. Club 25:300.

Digitaria setosa Desv.

Inflorescence panicled, long-exserted, of 6–18 racemes, lowermost usually whorled; axis 2–5 cm., rarely to 20 cm. long, striate, glabrous. Racemes spreading, filiform, 5–10 cm. long; rachis 3-angled, hispidulous on the margins. Spikelets in pairs .7 x 2.4 mm., lanceolate, acuminate. First glume wanting; second ½ the length of the spikelet, lanceolate, acuminate, 3-nerved, villous at the summit; third 2.4 mm., prominently 5-nerved, villous on the margins and summit; floral glume nearly equal to third, greenish purple, papillo-striate; palea equal and of like texture. Grain translucent pinkish white, ellipsoid, .5 x 1.25 mm.; in section convexo-concave.



Hab.—San Felipe, *Gaumer 1405, 2490*, Chichankanab *1524*, Pocoboch *2494.*

Yucatan specimens have longer panicles of more scattered racemes than our specimens from subtropical Florida and St. Croix.

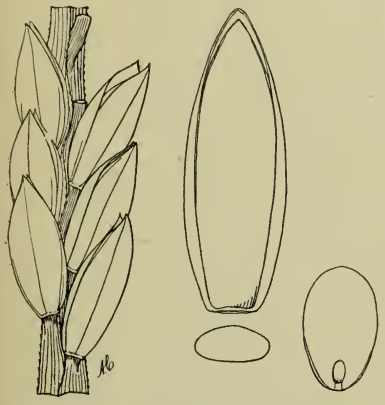
PASPALUM L. Syst. Ed. 10, 2:855.

Inflorescence of spikelike racemes, panicled or digitate. Spikelets 1-flowered, perfect, in 2 rows on one side of the flattened rachis, rachilla articulated below the empty glumes. Glumes 2–4 (usually 3), empty glumes thin or membranaceous, fruiting glumes coriaceous, the margins of the glume inrolled over the palea. Grain dorsally compressed, enclosed in the fruiting glumes, free. Stamens 3.

Empty glume 1	*elongatum.*
Empty glumes 2:	
Spikelets glabrate, single	*vaginatum.*
Spikelets hirsute, in pairs	*lentiginosum.*
Empty glumes 3	*oricolum.*

Paspalum vaginatum Swartz Prod. Ind. Occ. 21.

Racemes 2–4, digitate or fasciculate, short exserted, 2.5–6 cm. long, 4 mm. wide; rachis minutely scabrous on the margins, a few white hairs at the axils. Spikelets single on very short pedicels, 1.4 x 4 mm., lanceolate-ovate, acuminate. Empty glumes 2, equal, glabrous, first 2-nerved (midnerve obsolete), second 3-nerved; fruiting glumes stramineous 1.3 x 4 mm., lanceolate-ovate, acute; apex of palea not enclosed. Grain light brown, obovoid; in section unequally biconvex.

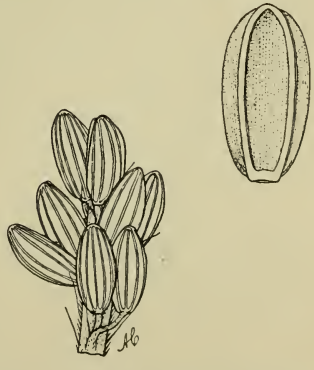


Hab.—In fresh water at the aguada and Cenoté de Nabulá, on the Hacienda Chablé, August, *Schott 546;* salt swamps near Sisal, Nov. 1865, *733*; Progreso, *Gaumer 1510.*

The species apparently rarely perfects seed.

Paspalum elongatum Griseb. Pl. Lorentz. 260.

Panicle short exserted of 12–14 racemes, axis 10–12 cm. long, glabrous, internodes .5–2 cm., racemes spreading or ascending, 2–3.5 cm. long, 3 mm. wide, 1 or 2 at a node; rachis hispidulous on the margins and bearing scattered bristle-like white hairs, a tuft of similar hairs at the axils. Spikelets in pairs on scabrous pedicels, 1.1 x 2.3 mm., purplish, oval-oblong, obtuse. Empty glume one, oblong, subacute, 3 nerved, glabrous; fruiting glumes oval-oblong, 1.1 x 2.3 mm., the glume prominently 5-nerved, papillo-striate, the palea of like texture. Grain not seen.



Hab.—Merida Aug. 3, 1865 *Schott 593;* specimen immature. (Illustration and description drawn from *Mandon Pl. Boliv. 1253*, cited by Grisebach in his description of the species, which, however, is only in bloom, having no seed formed.)

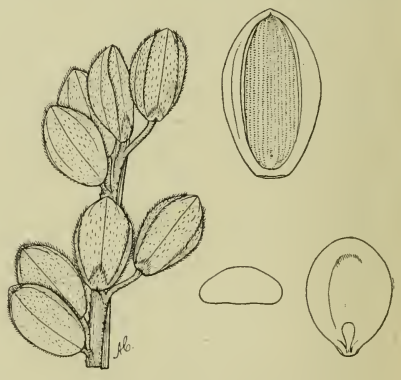
Paspalum lentiginosum Presl. in Rel. Haenk. 1:218.

Panicle exserted, of 3–12 racemes; axis 5–15 cm. long, glabrous, internodes .5–6 cm., racemes spreading or ascending, 2–10 cm. long, 3 mm. wide, the upper approximate, sometimes subfasciculate, the racemes rarely compound, rachis hispidulous on the margins, a few long white hairs at the axils. Spikelets in pairs on scabrous pedicels 1.2 x 1.4 mm., obovate-orbicular, obtuse. Empty glumes 2, equal, 3-nerved, speckled with purplish brown, hirsute with short, stiff, white, gland-tipped hairs, first glume orbicular, second oval; fruiting glumes 1 x 1.2 mm., stramineous, orbicular with a narrowed base, smooth and shining. Grain pale brown, orbicular, .8 x .9 mm.; in section concavo-convex.

Hab.—Merida, July 11, 1865, *Schott 597;* common on old fields about Izamal, 30 inches high, Sept., *Gaumer 852* (*Paspalum paniculatum* Field Col. Mus. Bot. 1:288), Chichankanab *1461*, *1523*, *2464*.

Paspalum oricolum sp. nov.

Panicle included at base or finally exserted, of 3–7 racemes; axis 5–20 cm. long, glabrous, internodes 1–5 cm.; racemes ascending or spreading, 3–8 cm. long, 4 mm. wide, the lower rarely long-peduncled; rachis scabrous on the margins, a few long white hairs at the axils. Spikelets in pairs on scabrous pedicels, 1.6–2.4 mm., fuscous, obovate, subacute. Empty glumes 3, the first triangular, ciliate, on the lower of the pair of spikelets ¼–⅓ the length of the spikelet, on the upper spikelet minute; second and third glumes subequal, 5-nerved, papillo-hirsute and speckled with dark brown; second broadly ovate, apiculate; third ovate, blunt; fruiting glumes 1.3 x 2.4 mm., stramineous, obovate, subacute, papillo-striate. Grain pale brown, oblong with narrowed base, 1 x 1.5 mm.; in section sub-plano-convex. Plant perennial, branching at the base, 2.5–7 dm. high; culms erect, glabrous; sheaths usually longer than the internodes, ciliate on the margins; ligule membranaceous, .5–1 mm. long; leaves 7–20 cm. long, 12–15 mm. wide, long acuminate, rounded and more or less ciliate at the base, margins usually fluted and minutely ciliate.



Hab.—Sandy pathway in open woods, northwest shore, Island of Cozumel, *Millspaugh Pl. Utowanæ 1480* (*Paspalum Schaffneri* Field Col. Mus. Bot. 2:24).

Ad. Tonduz 8038 Flora Costaricensis; *Tracy 7369* Pierce, Texas; and *Bush 264* Brazos River, Texas, are referable to this species.

PASPALUM ORICOLUM.

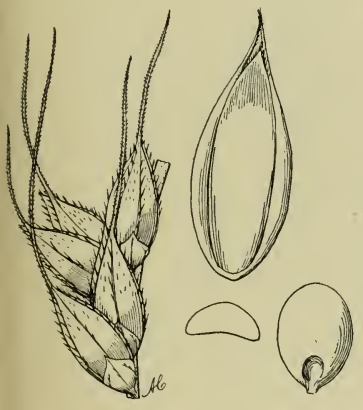
PANICUM L. Sp. Pl. 55.

Inflorescence racemed or panicled. Spikelets 1-flowered or sometimes with a staminate flower below the terminal perfect one, rachilla articulated below the empty glumes. Glumes 4, empty glumes membranaceous, fruiting glumes coriaceous, the margins of the glume inrolled over the palea. Grain dorsally compressed, enclosed in the fruiting glumes, free. Stamens 3.

Fruiting glumes smooth and shining:	
Palea free at the summit:	
Spikelets awned	*crus-galli.*
Spikelets awnless	*colonum.*
Palea included at the summit:	
Spikelets 1.5 mm. pubescent	*brevifolium.*
Spikelets over 3.5 mm. glabrate or nearly so:	
Obovate, empty glumes inflated	*divaricatum.*
Lanceolate, empty glumes not inflated:	*hirticaulum.*
Fruiting glumes transversely rugose:	
Oblong, blunt and pubescent at the summit	*maximum.*
Oval, acute and glabrate at the summit:	
Empty glumes hirsute	*Carthaginense.*
Empty glumes glabrate:	
Russet or brown, internerves transversely wrinkled	*fuscum.*
Pale green, not wrinkled	*paspaloides.*

Panicum crus-galli L. Sp. Pl. 56.

Panicle finally exserted, of 6–8 approximate racemes; axis 7–10 cm. long, flattened, hispidulous. Racemes erect, 1–2 cm. long; rachis hispidulous. Spikelets crowded in 2 to 4 rows, 1.6 x 4 mm. exclusive of awn, pale green, ovate-lanceolate, acuminate. First glume ⅓ the length of spikelet, mucronate, ciliolate, 3-nerved, hispid on the nerves, glabrous between them; second and third equal (exclusive of awn), 5-nerved, bristly-hispid on the nerves, internerves sparsely hispid toward the apex, the second glume mucronate or awn-tipped, the third bearing an antrorsely barbed awn 3–10 mm. long; fruiting glumes 1.3 x 3.5 mm., stramineous, lanceolate, acuminate, smooth and shining, minutely pubescent at the summit, apex of palea not included. Grain translucent pinkish white, oval with rounded apex, 1 x 1.5 mm.; in section convexo-concave.

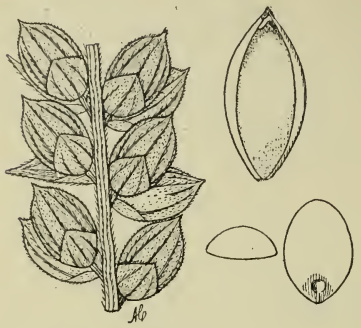


Hab.—Borders of an aguada at Kanachen, March, 1866, *Schott 832.*

Panicum colonum L. Syst. Ed. 10, 870.

Panicle exserted, of 4–12 racemes, axis 5–20 cm. long, glabrous or hispidulous toward the summit. Racemes more or less spreading, .5–3 cm. long; rachis flattened, hispidulous. Spikelets in pairs, one sessile and one short-pediceled, 1.4 x 2.6 mm., russet-green, oval, short-acuminate. First glume ½ the length of the spikelet, 3-nerved, hispid;

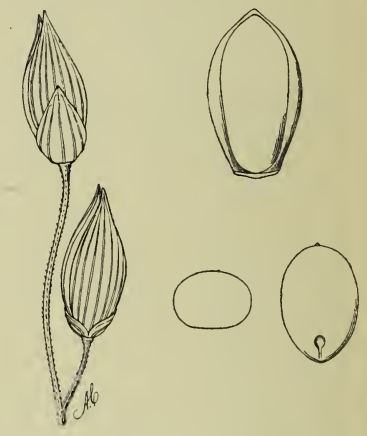
second and third equal, short-acuminate, 5-nerved, hispid on the nerves, hispidulous between them; fruiting glumes 1.1 x 2.3 mm., pale stramineous, elliptic, acute, smooth and shining, minutely pubescent at the summit; apex of palea not enclosed. Grain translucent, white, ellipsoid, with rounded apex, .9 x 1.4 mm., in section unequally biconvex.



Hab.—At the Quinta del Obispo, Merida, Nov., 1864, *Schott 42*, and June, July, 1865, *598;* common in old fields about Izamal, 16 inches high, Sept., 1895, *Gaumer 850, 2484,* Chichankanab, *1279, 1280, 1281, 1526,* Izamal, *2319,* Calotmul *2450.*

Panicum hirticaulum Presl. in Rel. Hænk. 1:308.

Panicle included at base or short exserted, 20–30 cm. long, 10–20 cm. wide, freely branching; branches alternate, spreading, 5–15 cm. long, spikelet bearing toward the ends; axis and rachis striate, scabrous. Spikelets tawny green, sometimes tinged with plum color, ovate-lanceolate, acuminate, 1.5 x 3.7 mm., glabrous, on flexuous scabrous pedicels. First glume one-half the length of the spikelet or longer, acute, 7-nerved, second and third equal, 9-nerved; fruiting glumes pale brown, oblong-elliptic, subacute, 1.1–1.2 x 2.2 mm., smooth and shining. Grain brownish white, 1 x 1.5 mm., oblong-obovoid, in section depressed globose.



Hab.—Chichankanab, *Gaumer 1501,* a depauperate roadside specimen growing with Panicum maximum at Izamal, *2477.*

Panicum brevifolium L. Sp. Pl. 59.

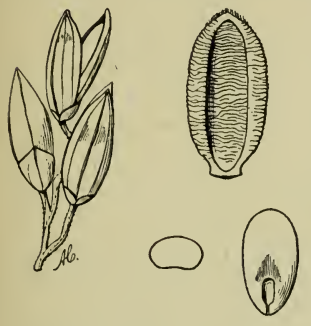
Panicle included at the base, or short-exserted, 7–16 cm. long, 6–12 cm. wide; axis sparsely pubescent, with long, spreading, white hairs; branches alternate, spreading, 2–8 cm. long; rachis capillary, minutely hispidulous. Spikelets .6 x 1.5 mm., green or brownish, oval, acute, pubescent, on long, flexuous, glabrous pedicels. First glume nearly ½ the length of the spikelet, acute, 3-nerved; second slightly shorter than the third, obtuse, 5-nerved; third subacute, 5-nerved; fruiting glumes .6 x 1.5 mm., light brown, oval, acute, minutely papillo-striate. Grain translucent brownish white, ovoid, subacute, .5 x .8 mm.; in section reniform-cordate.

Hab.—Common in small limestone caves in the brush and forest about Izamal, 4 feet high, Jan. to Dec., 1895, *Gaumer 2488*, *522* (*Panicum brevifolium* Kunth. Field Col. Mus. Bot. 1:288), shady places, San Anselmo, Aug., *895*, *2027*.

Panicum maximum Jacq. Ic. Pl. Rar. 1, t. 13:76.

Panicum jumentorum Pers.

Panicle included at the base or short exserted, 9–35 cm. long, 5–15 cm. wide; branches sub-verticillate, ascending, 4–15 cm., lower third to half naked; axis and rachis glabrous or minutely hispidulous, the latter with a tuft of tawny hairs at the base. Spikelets 1.1 x 3.3 mm., green, oblong-lanceolate, acute, glabrous, on flexuous, hispidulous pedicels. First glume ⅓ the length of spikelet, 5-nerved, the lateral pair faint; second slightly shorter than the third, 5-nerved; third 5-nerved, subtending a membranaceous palea of equal length and a staminate flower; fruiting glumes 1 x 2.3 mm., pale stramineous, oblong, subacute, minutely pubescent at the summit, transversely rugose. Grain greenish white, oblong, .7 x 1.4 mm., in section convexo-concave.



Hab.—Merida, Aug. 20, 1865, *Schott 595;* Izamal, *Gaumer 719*. Common in cultivation as Guinea grass, Sacate Guinea, the principal forage grass of the haciendas.

Panicum divaricatum L. Amœn. Acad. 5:302.

Panicle included at the base, 4–12 cm. long, 3–8 cm. wide, branches divaricate or deflexed, 2–4 cm. long; axis and rachis subflexuous, hispidulous, pubescent in the axils. Spikelets 2.8 x 4 mm. and 3 mm. thick, light green or becoming purple, or sometimes shining black, obovate, apiculate, deflexed on slender hispidulous pedicels, 1 to several times the length of the spikelet. First glume ⅓ the length of the spikelet, inflated, suborbicular, acute, with 5 strong, hispidulous nerves and faint glabrous intermediate nerves, apex ciliate; second and third equal, inflated, papery, 11-nerved, ciliate at the apex, otherwise glabrous, the third subtending a membranaceous palea and sometimes a staminate flower; fruiting glumes 2.1 x 3.3 mm., greenish-white or tinged with purple, obovate-oblong, striatulate, shining, floral glume and

palea each with a crateriform blackish apex surrounded by pubescence, the palea concave below, gibbous above, and the glume having a short dorsal furrow near the base. Grain white, suborbicular, 1.6 x 2 mm.; in section convexo-concave.

Hab.—Merida, 8–10 feet high, Oct. 11, 1865, *Schott 675*, "Common on fences in low brush lands, 4 feet high, Izamal," *Gaumer 1032*, *2482*, Chichankanab *2144*, *2409*, *2462*.

Panicum divaricatum latifolium (Rupr.) Fourn. Mex. Pl. Enum. Gram. 32.

Panicum latifolium Rupr. Bull. Acad. Brux. 9:14. *non* L.

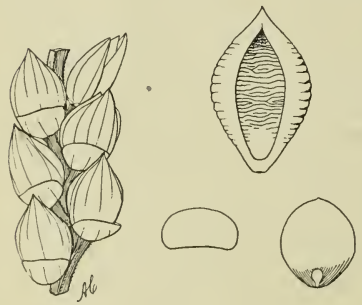
Panicles larger, branches spreading rather than divaricate. Spikelets as in divaricatum L. but more numerous on shorter pedicels; fruiting glumes slightly more oblong, .2 mm. or less longer. Leaves two to three times the width of those of the species and often twice their length, puberulent or velvety beneath; their sheaths hirsute and ciliate. Plant more erect, less branching.

Hab.—Merida, Aug. and Sept., 1865, *Schott 600;* "Common in waste places about Izamal, 4 feet high," July 1895, *Gaumer 878;* (Panicum divaricatum var ———? Field Col. Mus. Bot. 1:288.) "Common along old fences and in brushlands near Izamal, Aug. to Feb." *1025*, Calotmul *2141*, Chichankanab *2461;* margin of a well at Chan Oonot, *Millspaugh Pl. Utowanæ 1639* (*Panicum compactum* Field Col. Mus. Bot. 2:24).

Called ZIT, "reed-grass" or "small cane," by the Mayas.

Panicum paspaloides Pers. Syn. 1:81.

Panicle included at the base, of 10–12 racemes; axis 12–15 cm. long, flattened, hispidulous on the margins. Racemes erect, 1.5–2.5 cm. long. Spikelets alternate on short pedicels on one side of the flattened, zigzag, hispidulous rachis, 1.4 x 2.4 mm., pale green, ovate, acute, glabrous. First glume ⅓ the length of spikelet, broad, truncate, 3-nerved; second slightly shorter than third, subacute, 5-nerved; third short-acuminate, 5-nerved; fruiting glumes 1.3 x 2.2 mm., light brown, oval, base acute, apex acuminate, transversely rugose. Grain brownish-white, suborbicular, 1 x 1.2 mm.; in section convexo-concave.

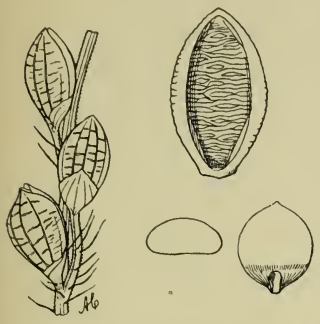


Hab.—"Common in old fields, 3 feet high, Oct.," Izamal, *Gaumer 1027* (*Paspalum paspaloides* Field Col. Mus. Bot. 1:354), Chichankanab *2489*.

Panicum fuscum Swartz Prod. Veg. Ind. Occ. 23.

Panicle at first included, exserted at maturity, dense, contracted, 6–12 cm. long, 2–5 cm. wide; axis hispid and bearing scattered,

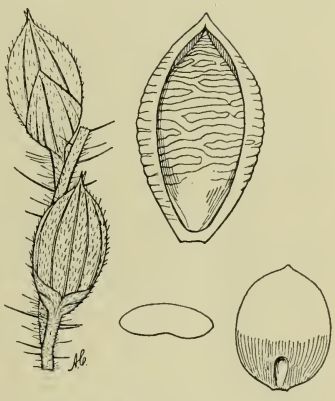
spreading white hairs, branches erect-ascending, 2–6 cm. long; rachis hispid; long-hirsute at the base. Spikelets 1.4x2.5 mm., russet or brown, obovate, subacute, glabrous, on hispid pedicels bearing scattered stiff white hairs. First glume less than ½ the length of the spikelet, 5-nerved; second and third equal, 7-nerved, internerves transversely wrinkled; fruiting glumes 1.3 x 2.2 mm., pale stramineous, oval, subacute, transversely rugose. Grain brownish-ocher, orbicular with acute apex and base, 1 x 1.2 mm.; in section plano-convex.



Hab.—Merida, May and June, 1865, *Schott 384;* environs of Merida, 1887, *Millspaugh 47;* Chichankanab, *Gaumer 1298*, forests of Buena Vista Xbac, Sept. *2284*, Izamal *2320*.

Panicum Carthaginense Swartz Fl. Ind. Occ. 1:148.

Panicle exserted, few-flowered, 5–7 cm. long, 1–1.5 cm. wide; branches few, erect-ascending, 1 cm. or less in length; axis and rachis densely hirsute with stiff white spreading hairs. Spikelets 1.9x4 mm., russet-green, obovate-oval, mucronate on short hirsute pedicels. First glume over ½ the length of spikelet, 5-nerved, mucronate, hirsute; second and third equal, mucronate, 7-nerved, hirsute, internerves obscurely transversely wrinkled; fruiting glumes 1.6 x 3 mm., pale stramineous, oval, acute, transversely rugose. Grain brownish-ocher, broadly oval with acute apex, 1.2 x 1.65 mm.; in section biconvex with shallow furrow on the ventrum.



Hab.—Merida, July 11, 1865, *Schott 592*.

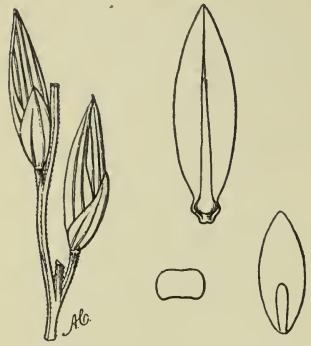
ICHNANTHUS Beauv. Agrost. 56. t. 12, f. 1.

Inflorescence a simple panicle. Spikelets in pairs, 1-flowered, perfect; rachilla articulated below the empty glumes. Glumes 4, empty glumes membranaceous, fruiting glumes coriaceous, the glume (in our species) auricled at the base, margins not inrolled but closely folded about the palea. Grain dorsally compressed, enclosed within the fruiting glumes. Stamens 3.

Ichnanthus lanceolatus Scribn. & Sm. Bull. 4. Div. Agrost. Studies on Am. Grass., 36.

Panicle short exserted, 8–15 cm. long, 3–5 cm. wide; branches erect

or ascending, 2–8 cm. long, axis and rachis hispidulous. Spikelets 1 x 4.3 mm., green, ovate-lanceolate, acute, in pairs, one subsessile, the other on a hispidulous pedicel about as long as itself. First glume ½ the length of the spikelet, strongly 3-nerved, scabrous toward the summit; second and third equal, strongly 5-nerved, glabrous, the second nearly clasping the third which again clasps the base of the fourth; fruiting glumes .8 x 2.9 mm., pale green, oblong-lanceolate, acute, smooth and shining; floral glume auricled at the base, the enclosed palea somewhat gibbous between the auricles. Grain greenish white, ellipsoid, .6 x 1.6 mm.; in section depressed plano-convex.



Hab.—Common in old fields, Izamal, 2 feet high, Sept., *Gaumer 854*, "Common in forests of Buena Vista Xbac," Sept., *1111*, Chichankanab *2181*.

Called X-KAN-CHIM, "yellow capsule," by the Mayas.

OPLISMENUS Beauv. Fl. d'Owar. 2:14.

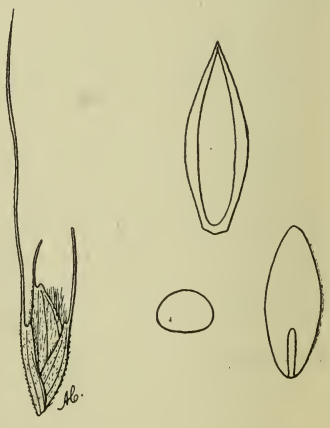
Spikelets in small clusters, usually unilateral along the branches of the panicle, 1-flowered, perfect; rachilla articulated below the empty glumes. Glumes 4, empty glumes membranaceous, awned; fruiting glumes coriaceous, the margins of the glume not inrolled but closely folded about the palea. Grain elliptic, little or not compressed, enclosed in the fruiting glumes, free. Stamens 3.

Awns smooth, grain dorsally compressed	*hirtellus.*
Awns scabrous, grain terete	*Burmannii.*

Oplismenus hirtellus (L.) R. & S. Syst. 2:481.

Panicum hirtellum L.

Panicle long-exserted, 4–6 cm. long, of 3–5 one-sided few-flowered racemes, axis minutely scabrous; racemes spreading, 1 cm. long or less, spikelets in pairs in 2 rows on one side of the scabrous, angled rachis, 3.5 mm. long (excluding awns), yellowish green. First and second glumes subequal, emarginate, pubescent, ciliate, 5-nerved, bearing smooth, stiff awns, that of first glume 8–9 mm., of second 2.5–3 mm.; third glume emarginate, 7-nerved, pubescent, long-ciliate in the middle and with a few long hairs in the middle of the pubescent keel, awn 1 mm., smooth; fruiting glumes .8 x 2.9 mm., pale green, lanceolate, acute, smooth and shining. Grain translucent purplish white, lanceolate-ellipsoid, obtuse, .75 x 2 mm., in section unequally biconvex.



Hab.—North shore of Island of Cozumel, Feb. 18-19, 1899, *Millspaugh Pl. Utowanæ 1483*.

Oplismenus Burmannii (Retz) Beauv. Agrost. 54.

Panicum Burmannii Retz.

Oplismenus cristatus Presl.

Panicle finally exserted, 5–7 cm. long, of 8–12 one-sided racemes; axis densely long-hirsute; racemes ascending, 1–2 cm. long. Spikelets single in two rows on one side of the flattened, hairy rachis, 3.5–4 mm. long (excluding awns), silvery green, clothed with long, white hairs at the base. First and second glumes subequal, deeply emarginate, 5-nerved, ciliate, bearing slender, antrorsely scabrous awns, that of first glume 12–20 mm., of second, 8–10 mm.; third glume emarginate, 9–11 nerved, ciliate, and with a band of long, white hairs about the middle, awn 1 mm.; fruiting glumes .8x2.3 mm., greenish-white, lanceolate-ellipsoid, acute, smooth and shining, .75x1.9 mm.; in section suborbicular. Grain translucent pinkish cream, lanceolate-ellipsoid, acute.

Hab.—Merida at Quinta del Obispo, Nov., 1864, *Schott 55*, and Merida, July, 1865, *384;* "Common about the mouths of caves around cenotés and aguadas in densely shady places, 3 feet high," Oct., *Gaumer 1038*, San Anselmo *2026*, *2428*, Calotmul *2429*.

A variable species, especially in the length of the awns and basal hairs of the spikelet.

CHÆTOCHLOA Scribn. U. S. Dept. Agr. Div. Agros. Bull. 4:38.

Spikelets surrounded by a few or many persistent awn-like branches which spring from the pedicels below the articulation of the spikelets, giving the dense cylindrical spike-like panicle a bristly appearance, 1-flowered, or sometimes a staminate flower below the terminal perfect one. Glumes 4, empty glumes membranaceous, fruiting glumes coriaceous, rugose, the margins of the glume inrolled over the palea. Grain dorsally compressed, enclosed in the fruiting glumes, free. Stamens 3.

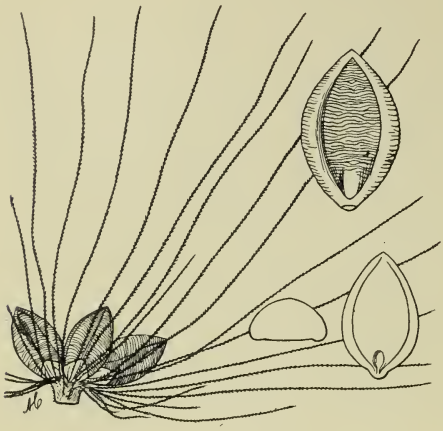
Setæ several	*geniculata.*
solitary	*polystachya.*

Chætochloa geniculata comb. nov. (Lam.) Scribner & Merrill Am. Gr. Bull. 21:12.

Panicum geniculatum Lam.

Panicle long exserted, dense, 2–12 cm. long, 2 cm. wide (.6–.8

cm. excluding setæ); rachis pubescent, branches short, contiguous, pubescent, 1 or rarely 2-flowered; setæ 8–12, involucrate, spreading, 5–12 mm., long, unequal, slender, tawny, minutely antrorsely barbed. Spikelets 1.2x2.2 mm., ovate, acute, glabrous. First glume ⅓ the length of the spikelet, broad, obtuse, 3-nerved; second ½ the length of the third, broadly ovate, obtuse, 5-nerved, third equal to floral glume, acute, transversely rugose, 5-nerved, the mid-nerve deeply impressed, subtending a hyaline, empty palea of equal length; fruiting glumes 1.3–x2.1 mm., pale stramineous, ellipsoid-ovate, acute, transversely rugose. Grain translucent brownish-white, ovate, subacute, 1x1.6 mm.; in section plano-convex.

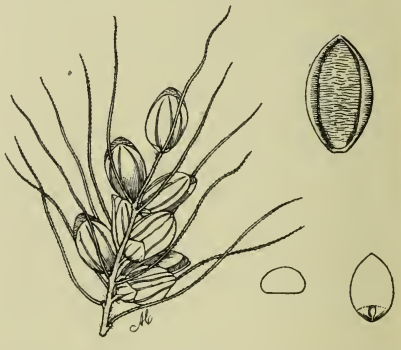


Hab.—Abundant in old fields near Izamal, 2 feet high, June to Dec., *Gaumer 756* (*Setaria flava* Field Col. Mus. Bot. 1:288), Chichankanab, *1938*.

Chætochloa polystachya (Scheele) Scribn. & Merrill, Am. Gras. Bull., 21:37.

Setaria polystachya Scheele.

Panicle exserted, 2–2.5 cm. long, 1.5–2.5 cm. wide; rachis angled, pilose; branches slender, 1–3 cm. long, pubescent; setæ solitary, ascending, 4–10 mm. long, flexuous, yellowish green, antrorsely scabrous. Spikelets oval, obtuse, .9–1x1.6–1.8 mm., glabrous. First glume one-third the length of the spikelet, broad, obtuse, 3-nerved; second shorter than the third, broadly ovate, obtuse, 5-nerved; third equal to floral glume, acute, 5-nerved, slightly sulcate, subtending a linear-lanceolate, hyaline palea; fruiting glumes pale stramineous, ellipsoid, acute, .85x1.5 mm., minutely transversely rugose. Grain dull brownish white, ovate, subacute, .65x.9 mm., in section plano-convex.



Hab.—In old fields about Izamal, Sept., *Gaumer 2478*.

SETARIOPSIS Scribn. Field Col. Mus. Bot. 1:288.

Inflorescence composed of sub-spicate panicles; primary and secondary branches prolonged beyond the spikelets into slender awn-like

bristles. Glumes of the spikelet 4, the second auriculate and the third lyre-shaped near the base; fruiting glumes indurated, mucronate, the margins of the floral glume inrolled as in Panicum. Grain dorsally compressed, enclosed in the fruiting glumes, free. Stamens 3.

Setatariopsis auriculata (Fourn.) Scribn. *ibid.*

Setaria auriculata Fourn.

Panicles exserted, 5–15 cm. long, 1–1.5 cm. wide; branches alternate, ascending, 8–20 mm. long; axis and rachis hirsute. Spikelets 1.4x2.9 mm., light green, ovate, apparently acute by the involution of the glumes, glabrous on short hispid pedicels, each bearing a slender flexuous antrorsely-barbed awn, 6–12 mm. long. First glume $\frac{1}{5}$ the length of the spikelet, broader than high, obtuse with the apex inrolled at maturity, 7-nerved; second nearly the length of the third, broadly ovate, obtuse, auriculate near the base, 13-nerved; third narrower, somewhat lyre-shaped and corky at the base, the margins becoming subcoriaceous at maturity, 11-nerved, subtending a minute hyaline palea; fruiting glumes pale stramineous, 1.2x2 mm., ovate, mucronate, transversely rugose. Grain pinkish white, ovoid, acute, .9x1.3 mm.; in section truncate plano-convex.

Hab.—Merida, July 11, 1865, *Schott 591, 592*, Hacienda Saragossa, Sept. 9, 1865, *621;* common in old fields about Izamal, Sept., *Gaumer 2479, 849* (type of the genus), Chichankanab, *1997*.

CENCHRUS L. Sp. Pl. 1049.

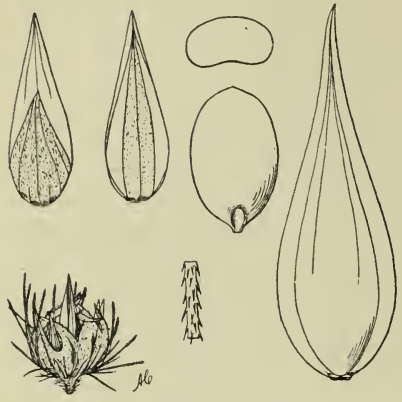
Inflorescence spicate, axis flexuous, scabrous or hispid; spikelets in 2's–6's subtended by a short-pediceled involucre of rigid connate spines which is deciduous with them at maturity. Glumes mostly 4, first sometimes wanting; fruiting glumes indurated, but less so than in Panicum, the floral glume not inrolled at the margins and having a short prominent keel each side of the midnerve at the base. Grain dorsally compressed, enclosed in the fruiting glumes, free. Stamens 3.

Basal bristles few, stout	*tribuloides.*
Basal bristles numerous:	
Lobes of the involucre interlocking:	
Spines 3–6 mm., retrorsely barbed	*viridis.*
Spines 6–12 mm., antrorsely barbed	*pallidus.*
Lobes of the involucre erect or spreading:	
Shorter than the spikelets	*brevisetus,*
Equaling or exceeding the spikelets:	
Spikelets 4–5 in each involucre, 5.7 mm.	*echinatus.*
Spikelets 2–3 in each involucre, 6.5 mm.	*insularis.*

Cenchrus viridis Spreng. Syst. 1:301.

Spikes long exserted, 4–8 cm. long, of 20–50 or more crowded involucres, 6x6 mm. including bristles, on pilose pedicels; the 7–8

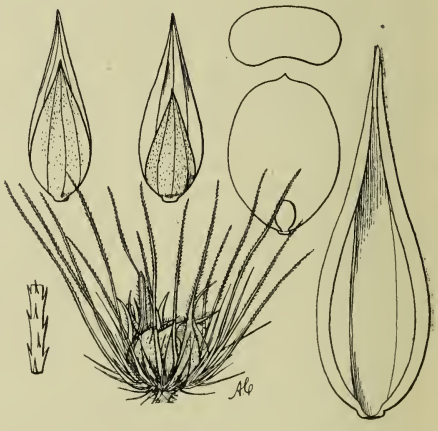
divisions attenuate, interlocked, pubescent, green-nerved toward the apex; spines 3–6 mm. long, retrorsely barbed; basal bristles filiform, scabrous. Spikelets 2–3 in each involucre, the tips exserted, 1.6x5 mm. ovate-lanceolate, acute. First glume wanting, second over ½ the length of the spikelet, ovate, acute, 3-nerved, puberulent; third nearly as long as the spikelet, acute, 3-nerved, internerves puberulent, the enclosed palea minute or wanting; fruiting glumes 1.5x5 mm. ovate-lanceolate, acuminate, the glume 5-nerved, palea glabrous. Grain pale stramineous, oval, 1.15x1.9 mm.; in section convexo-concave.



Hab. — Chichankanab, *Gaumer 2170;* east shore of Island of Cozumel, *Millspaugh Pl. Utowanæ 1599*, and arid plains south of Progreso, *1682*.

Cenchrus pallidus Fourn. Mex. Pl. Enum. Gram. 50.

Spikes exserted, 2.5–7 cm. long, of 10–50 (sometimes more) crowded involucres, 13x15 mm., including bristles, on pilose pedicels; the 7–8 divisions attenuate, interlocked, pubescent, ciliate below, barbulate at the apex; spines 6–12 mm. long, purplish, antrorsely barbed; basal bristles numerous, slender, minutely barbed. Spikelets 2–3 in each involucre, 1.5x5 mm., ovate-lanceolate, acuminate. First glume wanting, second over ½ the length of the spikelet, purplish brown, ovate, acute, 3-nerved, puberulent; third ¾ the length of the spikelet, purplish brown, acute, 5-nerved, puberulent except near the margins below, subtending a brown, scabrous, 2-nerved palea nearly its own length; fruiting glumes 1.5x5 mm., ovate-lanceolate, acuminate, the glume 5-nerved, nerves scabrous above; palea puberulent between the two nerves. Grain pale stramineous, broadly oval, apiculate, 1.5x2.1 mm.; in section convexo-concave.

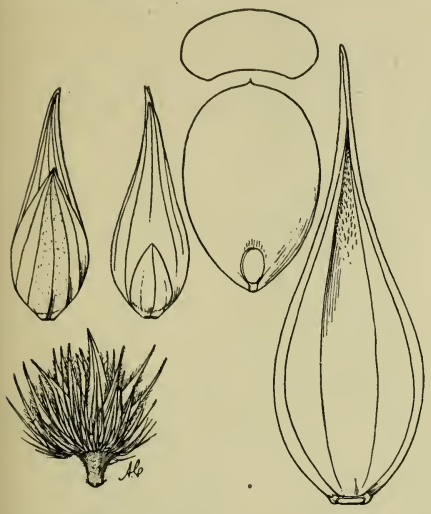


Hab.—Merida, July 27, 1865, *Schott 498* in part, July 2–Aug. 27, 1865, *596;* crevices in rocks on the patio of Dr. Gaumer, Izamal, Jan. 13, 1895, *Millspaugh, Armour Exped. 70;* Izamal, *Gaumer 2493*, Chichankanab *2326*.

Called MOOL, "claw-grass," by the Mayas.

Cenchrus brevisetus Fourn. *ibid.*

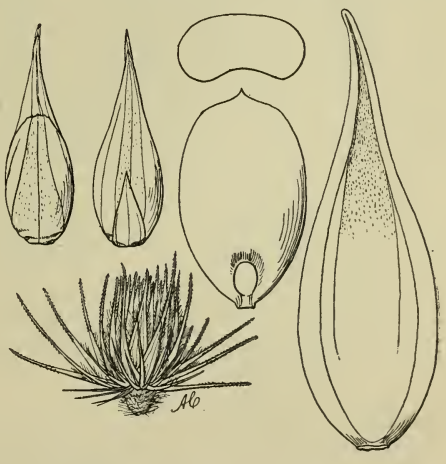
Spikes exserted, 2.5–5 cm. long of 10–20 involucres, 8x9 mm., including bristles, on pubescent pedicels, the 8–9 divisions spine-pointed, erect, long-ciliate to near the apex; spines 2–4 mm., purplish, pubescent, ciliate at the base, retrorsely barbed toward the apex; basal bristles numerous, stout, scabrous. Spikelets 3–4 in each involucre, 2x6 mm., sometimes purplish above, lanceolate-ovate, acuminate. First glume minute, faintly 3-nerved, hyaline; second ⅔ the length of spikelet, broadly ovate, acute, 5-nerved, middle internerves puberulent, third as long as the floral glumes or nearly so, acute, 5-nerved, subtending a scabrous 2-nerved palea of its own length; fruiting glumes, 1.9x6 mm., lanceolate-ovate, acuminate, the glume 5-nerved, basal keels winged; palea puberulent above between the 2 nerves. Grain stramineous, obovoid-oblong, 1.8x2.7 mm.; in section convexo-concave.



Hab.—Sands of the beach at Progreso, especially near the cattle pens where many cattle are herded on arrival from Tampico and other ports on the Gulf coast of Mexico, Jan. 26, 1895, *Millspaugh, Armour Exped. 205.*

Cenchrus echinatus L. Sp. Pl. 1050.

Spikes short-exserted, 3–8 cm. long, of 10–25 involucres, 8x13 mm., including bristles, on densely hirsute pedicels, the 8–10 divisions spine-pointed, erect; spines 3–5 mm. long, purplish, pubescent, long-ciliate at the base, retrorsely barbed toward the apex; basal bristles numerous, slender, barbulate. Spikelets 4–5 in each involucre, 1.75x5.7 mm., lanceolate-ovate, acuminate. First glume ⅓ the length of spikelet, lanceolate, acute, 3-nerved, hyaline; second, ⅔ the length of spikelet, broadly ovate, truncate, 2–3 toothed by the excurrent tips of the nerves, 5-nerved, middle pair of internerves puberulent; third nearly as long as floral glume, acute, 5-nerved, middle

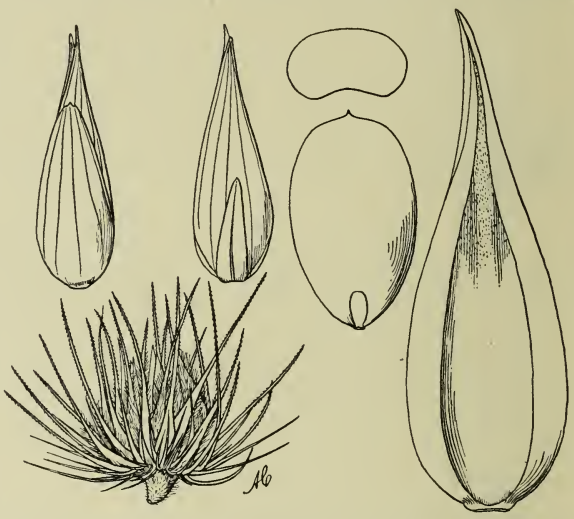


internerves puberulent, subtending a brown, scabrous palea nearly its own length; fruiting glumes 1.7 x 5.7 mm., lanceolate-ovate, short-acuminate, glume 5-nerved, the basal keels winged; palea puberulent above between the two nerves. Grain stramineous, oval-oblong, apiculate, 1.7 x 2.8 mm., in section convexo-concave.

Hab.—Merida, Aug. 27, 1865, *Schott 498* in part; "Very abundant on cultivated lands near Izamal, 18 inches high," *Gaumer 1084;* arid rock-strewn plain south of Progreso, *Millspaugh Pl. Utowanæ 1698*, Chichankanab *Gaumer 2448*.

Cenchrus insularis Scribn. Field Col. Mus. Bot. 2:26.

Spikes exserted, 5–7 cm. long, of 8–16 involucres, 12 x 16 mm. including bristles, on densely hirsute pedicels, the 7–8 divisions spine-pointed, erect; spines 6–9 mm. long, purplish, pubescent, long-ciliate at the base, retrorsely barbed toward the apex; basal bristles numerous, slender, glabrous. Spikelets 2–3 in each involucre, 2.2 x 6.5 mm., ovate-lanceolate, acuminate, glabrous. First glume ½ the length of the second, lanceolate, 1-nerved, hyaline, usually wanting; second ¾ the length of the spikelet, ovate, truncate, more or less toothed by the excurrent tips of the nerves, 5-nerved; third nearly the length of the floral glume, 5-nerved, acute, subtending a puberulent palea nearly its own length with 2 retrorsely hispid nerves; fruiting glumes, 2.1 x 6.5 mm., ovate-lanceolate, falcate-acuminate; floral glume 5-nerved, scabrous toward the apex, palea puberulent above between the 2 faint nerves. Grain stramineous, obovoid-oblong, apiculate, 1.7 x 2.8 mm.; in section convexo-concave.



Hab.—Pajaros Island, Alacran Shoal, March 8, 1899, *Millspaugh Pl. Utowanæ 1759*. (Type in Field Col. Mus. Herb. No. *61759*.) One plant only found, though being in full fruit others may appear from seed. This plant grew in the very center of the island where the booby nests are the thickest, and was the only representative of the species on the shoals. *No. 1607* reported in Field Col. Mus. Bot. 2:27 is C. tribuloides, not this species, which has only been found on the Alacrans.

Cenchrus tribuloides L. Sp. Pl. 1050.

Spikes included at base or short-exserted, 3–6 cm. long, of 10–16

CENCHRUS INSULARIS.

involucres, 10 x 10 mm., including spines, on pubescent pedicels, the 6–8 pubescent divisions spine-pointed; spines spreading or reflexed, 3–5 mm. long, pubescent to ciliate at the base, retrorsely minutely barbed toward the needle-pointed apex; basal bristles few, stout, scabrous. Spikelets 2 in each involucre, 1.7 x 5.5 mm., ovate-lanceolate, acuminate. First glume ⅓ the length of spikelet, ovate, acute, faintly 3-nerved, hyaline; second ⅔ the length of spikelet, broadly ovate, obtuse, 5-nerved, middle pair of internerves puberulent; third equal to floral glume, acute, 5-nerved, middle internerves puberulent, subtending a scabrous palea of its own length; fruiting glumes 1.7 x 5.2 mm., ovate, acuminate, glume 5-nerved, basal keels winged, pubescent near the margins above; palea puberulent above between the 2 nerves. Grain stramineous, obovoid-oblong, 1.4 x 2.2 mm.; in section flattened convexo-concave.

Hab.—Sandy east shore of island of Cozumel, about 4 miles from the northeast point, rare, *Millspaugh Pl. Utowanæ 1607*, southwest point of Perez Island, Alacran Shoal, *1756*.

STENOTAPHRUM Trin. Fund. Agrost. 175.

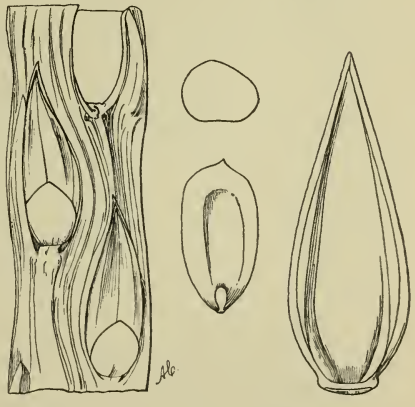
Inflorescence a spike-like panicle, the spikelets solitary or 2–4, forming a short partial spike embedded in the alternate notches on one side of the broad, striate, glabrous axis; rachis of the spike with a chaff-like prolongation. Spikelets 2-flowered, the lower staminate. Glumes 4, fruiting glumes indurated, margin of floral glume not unrolled. Grain dorsally compressed, enclosed in the fruiting glumes, free. Stamens 3.

Stenotaphrum secundum (Walt.) Kuntze Rev. Gen. Pl. 2:794.

Ischæmum secundum Walt. Fl. Car. 249.

Stenotaphrum Americanum Schrank.

Spicate panicle included at the base or short exserted, 7–10 cm. long, 5–6 mm. wide. Spikelets 2 x 5 mm., pale stramineous, oblong-lanceolate, acute, glabrous, solitary or 2–4 sessile on the flattened ciliate rachis. First glume ¼ the length of the spikelet, obtuse, nerveless; second acute, 7-nerved; third somewhat indurated, 3-nerved, subtending a similar



palea and staminate flower; fruiting glumes 1.6 x 4.5 mm., lanceolate-ovate, acute, smooth and shining. Grain light brown, obovoid-oblong, 1 x 2 mm.; in section unsymmetrical plano-convex.

Hab.—Grassy edge of sandy beach, west shore Island of Cozumel, at the portage to Laguna, Colombia, Jan. 7, 1895, *Millspaugh, Armour Exped. 50* (*Stenotaphrum Americanum* Schrank, Field Col. Mus. Bot. 1:10); Chichankanab, *Gaumer 1500.*

OLYRA L. Syst. Ed. 10, 1261.

Inflorescence monœcious; spikelets 1-flowered, the staminate spikelets upon the lower portion of a simple panicle, without empty glumes; pistillate spikelets much larger, with 2 empty, herbaceous, awned glumes; fruiting glumes, osseous, white and shining.

Olyra semiovata Trin. Diss. 2:249.

Panicle long-exserted, contracted, 8–14 cm. long, 2 cm. wide, axis and rachis scabrous. Staminate spikelets mostly in pairs on slender scabrous pedicels on the lower branches and on the lower part of the upper pistillate branches; floral glume 6 mm. (excluding awn), lanceolate, 3-nerved, nerves hispidulous above, awn 2 mm.; palea, acute, nerves hispidulous above. Pistillate spikelets 4 x 8 mm. (excluding awns), green, ovate, on scabrous clavate pedicels. First and second glumes ovate, oblong, awned, 7-nerved, scabrous especially on the nerves above; awn of first 8–12 mm., of second 4–5 mm. long, hispidulous; fruiting glumes 4 x 7 mm., old ivory white, shining, oval, subacute; floral glume white silky pubescent at base and margins. Mature grain not seen.

Hab.—Common at Chichanakanab, *Gaumer 1389*, Pocoboch *2372.*

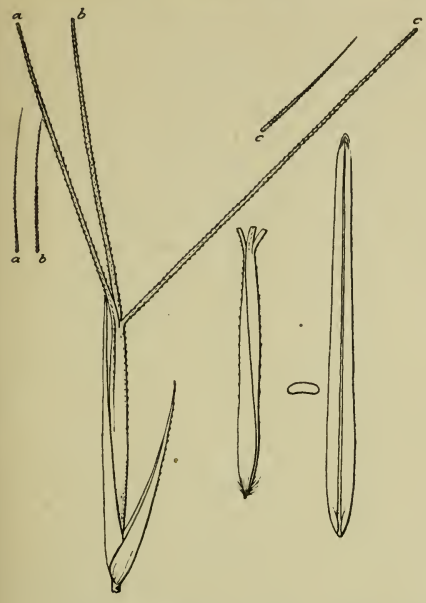
Yucatan specimens have fruiting glumes somewhat shorter and more densely pubescent than typical forms.

ARISTIDA L. Sp. Pl. 82.

Inflorescence paniculate. Spikelets 1-flowered, perfect, rachilla articulated above the empty glumes and produced into a hard obconical, hairy callus below the floral glume, but not extending beyond it. Glumes 3, first and second empty, the floral glume 3-nerved, silicate roughened, closely rolled around the palea and flower and terminating in a trifid or (§Streptachne) single awn. Grain elongated, tightly enclosed by the indurated fruiting glume, but free from it. Stamens 3.

Awn trifid, grain dorsally compressed:	
Floral glume 8 mm. stramineous	*bromoides.*
Floral glume 6.5 mm. plum-color	*nigrescens.*
Awn single, grain terete:	
Floral glume 10 mm. stramineous	*scabra.*
Floral glume 12 mm. mottled dark purple	*tenuis.*

Aristida nigrescens Presl. in Rel. Hænk. 1:223.



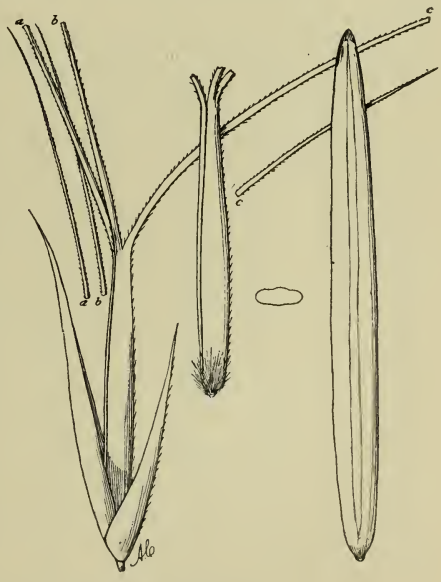
Panicle short-exserted, 15–20 cm. long, branches alternate, spreading or ascending; axis and rachis smooth. Spikelets 18–20 mm. long, on slender pedicels. First and second glumes plum-color, lanceolate, acuminate, 1-nerved, first 5.8 mm., hispid on the nerve, second 8 mm. glabrous; floral glume 6.5 mm. excluding awns, stramineous mottled with plum-color, mid-nerve hispid, lateral nerves hispid above; awn trifid, scabrous, middle awn divergent, 14 mm., lateral awns suberect, 12 mm.; palea 8 mm., hyaline. Grain light brown, linear-lanceolate, obtuse, .35 x 5.3 mm.; in section convexo-concave.

Hab.—Merida, Aug. 1865, *Schott 601*, Oct. 1865, *656a*.

Aristida bromoides H. B. K. Nov. Gen. 1:122.

Aristida Americana L. f.?

Aristida dispersa Trin. & Rupr.



Panicle exserted or nearly so, 10–15 cm. long; branches alternate, short, ascending; axis and rachis scabrous. Spikelets 20–22 mm. long on slender pedicels. First and second glumes purplish, lanceolate, acuminate, 1-nerved, the first 6.5 mm. long, hispid on the nerve, the second 9 mm., glabrous; floral glume, 8 mm. excluding awns, pale stramineous, hispidulous on the midnerve above; awn trifid, scabrous, middle awn divergent, 17 mm. long, lateral awns suberect, 14 mm.; palea 1 mm. or less, hyaline. Grain light brown, linear-lanceolate, obtuse, .6 x 7 mm.; in section elliptic.

Hab.—San Anselmo, 10 inches high, *Gaumer 1206*, Izamal *2147*, Chichankanab *2248*.

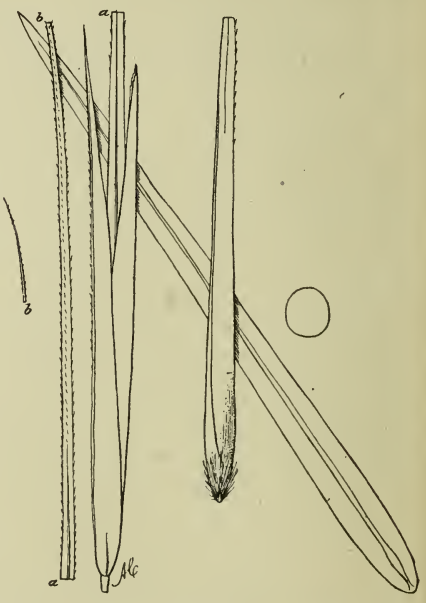
Aristida tenuis (H. B. K.) Kunth. Rev. Gram. 1:62.

Streptachne tenuis H. B. K.

Panicle exserted, 30–40 cm. long, branches alternate-subfasciculate, ascending; axis glabrous, rachis scabrous. Spikelets 30–36 mm. long on slender scabrous pedicels. First and second glumes purplish, lanceolate, acuminate, 1-nerved; first 8.6 mm., minutely strigose, hispid on the nerve; second 11 mm., glabrous; floral glume 12 mm. (excluding awn), mottled dark purple, awn 20–25 mm. long, scabrous, lateral awns obsolete; palea 1.4 mm., ovate, hyaline. Grain light brown, linear-lanceolate, acute, .6x9.5 mm.; in section ovoid-orbicular.

Hab.—Merida, Sept. 1865, *Schott 736;* "Among low shrubbery and along old fences, near Izamal, 3 feet high, uncommon. Aug." *Gaumer 1024.*

Aristida scabra (H. B. K.) Kunth. Rev. Gram. 1:62.



Streptachne scabra H. B. K.

Panicle included at base or finally exserted, 35–45 cm. long; branches alternate, ascending; axis and rachis very scabrous. Spikelets 24–40 mm. long, on slender, scabrous pedicels. First and second glumes purplish, lanceolate, acuminate, 1-nerved; first, 14 mm., scabrous, hispid on the nerve, the second 13.5 mm., glabrous; floral glume 10 mm. (excluding awn), pale, awn 15–30 mm. long, scabrous, lateral awns obsolete; palea minute, less than 1 mm. long, hyaline. Grain light brown, linear-lanceolate, acute, .5x9.3 mm.; in section suborbicular.

Hab.—"Two feet high, common," Chichankanab, *Gaumer 1448.*

SPOROBOLUS R. Br. Prod. 1:169.

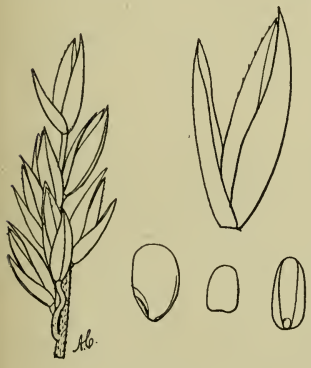
Inflorescence paniculate; spikelets 1-flowered, perfect, rachilla articulated above the empty glumes, not produced beyond the flower. Glumes 3, all thin or membranaceous, rounded on the back or slightly keeled, 1-nerved, awnless, the two outer ones empty. Grain laterally compressed, free, the pericarp loosely enclosing the seed, or very thin and evanescent. Stamens 3.

First glume less than ⅓ the length of spikelet:
Spikelet 2 mm., palea emarginate, splitting at maturity *Domingensis.*
Spikelet 1.3 mm., palea obtuse, not splitting *minutiflorus.*
First glume ¾ the length of spikelet *Virginicus.*

Sporobolus Virginicus (L.) Kunth Rev. Gram. 1:67.

Agrostis Virginica L.

Panicle usually included at the base, contracted, dense, 4–7 cm. long, 5–7 mm. wide; axis and rachis minutely scabrous. Spikelets .6–.8 x 2.5–2.8 mm., pale green, glabrous, on slender scabrous pedicels. First and second glumes ovate, acute, the first 2 mm., the second 2.5 mm. long; floral glume equal to second, ovate, subacute, minutely hispidulous on the nerve above; palea equal in length, ovate, acute, folded in from the back between the two nerves. Grain amber brown, obovoid, .4–.6 x .9 mm.; in section ovate-oblong with the ventrum slightly concave. The very thin pericarp indistinguishable in the dried state.



Hab.—Covering the south end of Perez Island (*Millspaugh Pl. Utowanæ 1750;*) Pajaros Island, and a small patch on the west end of Allison and Chica Islands, Alacran Shoal, March 8, 1899; San Anselmo, *Gaumer 2481.*

Sporobolus minutiflorus (Trin.) Link Hort. Berol. 1:88.

Vilfa minutiflora Trin.

Panicle short-exserted, elongated, 12–30 cm. long, 2.5–7 cm. wide, axis and rachis glabrous, branches alternate, spreading. Spikelets .5 x 1.3 mm., brownish, glabrous, on short, slender pedicels. First and second glumes lanceolate-ovate, the first .4 mm., obtuse, the second .6 mm., subacute; floral glume 1 mm., ovate, subacute; palea equal in length, obtuse, not infolded nor splitting between the two nerves. Grain reddish brown, oblong, .2–.5 x 1 mm.; in section oval, with concave ventrum. Pericarp very thin, loose

Hab.—Izamal, Sept., *Gaumer 891, 2328, 2491,* Chichankanab *1259, 1285.*

Sporobolus Domingensis (Trin.) Kunth Enum. 1:214.

Vilfa Domingensis Trin.

Panicle short exserted, spreading at maturity, 5–7 cm. long, 1–3 cm. wide, axis and rachis glabrous, branches subverticillate. Spikelets .7 x 2 mm., stramineous to light lead color, glabrous, on slender pedicels. First glume .6 mm., ovate, subacute; second 1.9 mm., ovate, acute; floral glume slightly longer, lanceolate-ovate, acute; palea 1.8 mm. broad, emarginate, a shallow fold between the 2 green nerves, easily splitting. Grain reddish brown, oval-oblong, .3–.55 x 1 mm.; in section oblong, rounded on dorsum, concave on ventrum. Pericarp very thin, loose.

Hab.—Arid scrub land south of Progreso, March 5, 1899, *Millspaugh Pl. Utowanæ 1713*.

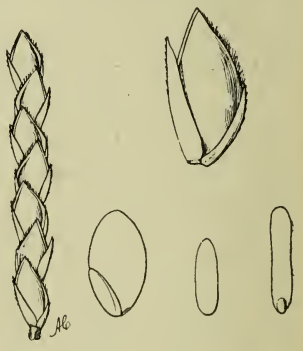
CYNODON Pers. Syn. 1:85.

Spikelets 1-flowered, awnless, compressed, singly sessile in 2 rows on one side of slender spikes, digitate at the end of peduncle, rachilla articulated above the empty glumes, produced into a short point behind the palea. Empty glumes 2, keeled; flowering glume broader, scaphoid. Grain laterally compressed, free. Stamens 3.

Cynodon Dactylon (L.) Pers. Syn. 1:85.

Panicum Dactylon L.

Inflorescence exserted, of 4–5 digitate spikes, 3–4 cm. long, 1.5–2 mm. wide; bearing 25–35 closely imbricated spikelets; rachis flat, hispidulous. Spikelets 1.1 x 2.1 mm., compressed. First and second glumes lanceolate, acute, 1-nerved, hispid on the keels, first 1.5 mm., second 1.7 mm. long; floral glume 2.2 mm. compressed, 1-nerved, silky-ciliate on the prominent keel; palea slightly exceeding its glume, broad, the 2 prominent nerves close together, ciliolate; rachilla produced 1.5 mm. or very short, blunt. Grain pinkish ashy, narrowly oblong, .25–.75 x 1.4 mm.; in section lanceolate oblong.



Hab.—At the Hacienda Saragossa, Sept. 8, 1865. *Schott 737;* frequent at Izamal, 1 foot high, April, 1895, *Gaumer 683,* Silam *1251*, Chichankanab *1295*.

This species flowers abundantly but seldom perfects seed.

CHLORIS Swartz Prod. Veg. Ind. Occ. 25.

Inflorescence of several to many spikes arranged in a false whorl. Spikelets 1-flowered, perfect, sessile in 2 rows along one side of a

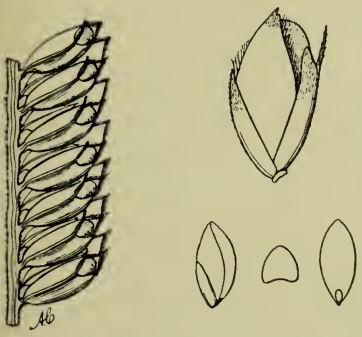
continuous rachis, forming unilateral spikes, rachilla articulated above the empty glumes and produced behind the palea, bearing 1 or more, usually awned, empty glumes; outer empty glumes 2, membranaceous; floral glume more or less indurated, bearing a single awn. Grain trilateral, free within the fruiting glume. Stamens 3.

Awns minute	*petræa.*
Awns prominent:	
1.5–2 mm., floral glume long ciliate on the keel	*ciliata.*
8–10 mm., floral glume long ciliate at the summit	*elegans.*

Chloris petræa Swartz Prod. Veg. Ind. Occ. 25.

Eustachys petræa Desf.

Inflorescence exserted, of 3–6 spikes, 7–9 cm. long, 2 mm. wide, with 100–170 crowded ascending spikelets; rachis 3-angled, scabrous; internodes .4 mm. long. Spikelets 1 x 2 mm., nearly sessile. First glume 1.3 mm., ovate, acute, strigose above, hispidulous on the keel, second 1.5 mm. broad, strigose above, bidentate, the stout green midrib prolonged into a scabrous upwardly curved awn .5–.6 mm. long; floral glume 1.8 mm., naviculate, ciliate with stiff tawny hairs on the midrib and margins, strigose at the summit, bidentate and bearing an erect awn .2 mm. long; palea equal in length, broadly oval, scabrous on the nerves; empty glume above floret 1, obovate, rounded and strigose at the summit, awnless; the floral glume, palea and empty glume shining chestnut brown. Grain translucent pinkish white, ellipsoid, .45–.5 x 1.1 mm.; in section conoid with concave ventrum.



Hab.—Arid rocky plain south of Progreso, *Millspaugh Pl. Utowanæ 1724;* island of Holbox, 1886, *Gaumer* (B).*

Chloris ciliata Swartz *ibid.*

Inflorescence included in the inflated sheaths, or sometimes exserted at maturity, of 3–7 purplish spikes, 4–8 cm. long, 4 mm. wide, with 60–120 ascending spikelets; rachis 3-angled, hirsute, internodes 1 mm. or less. Spikelets 2.5–3 x 3.5 mm. (including awns), on very short hirsute pedicels. First and second glumes lanceolate, acute, awn-tipped, hispid on the keel, first 1.5 mm., second 2.5 mm. long; floral glume 2.4 mm., ashy brown, hard and shining, naviculate, 1-nerved; bearing a scabrous awn 1.7 mm. long from below the apex, a tuft of stiff hairs at the base and densely ciliate on the keel and margins, except at base and summit, and with stiff white hairs 1–1.5 mm. long, scabrous-margined at the summit; palea equal in length, acute, densely ciliate on the nerves with short brown

*Biologia Centrali-Americana—Hemsley.

hairs; empty glumes above the floret 3; first 1.5 mm. long, broad, truncate and with a wide scarious margin, minutely bidentate, bearing a scabrous awn 1.5 long, and subtending an empty narrow palea 1 mm. long; second and third glumes like the first but smaller and awnless, the rachilla produced into a curved point .2–.3 mm. long, all enfolded or partly so in first empty glume. Grain reddish brown, ellipsoid, .5 –.65 x 1.4 mm.; in section depressed trilateral.

Hab.—Merida, Aug. 3, 1865, *Schott 383;* Calcehtoh, March 11, 1890, *Stone 274* (in Herb. Phila. Acad. Sci.); Chichankanab, *Gaumer 1342, 2311*, Izamal *2476*.

Chloris elegans H. B. K. Nov. Gen. et Sp. Pl. 1:166.

Inflorescence short exserted or sometimes included at the base, of 5–10 spikes, 4–6.5 cm. long, 7–8 mm. wide, with 40–65 ascending spikelets; rachis 3-angled, hirsute, internodes 1 mm. long. Spikelets 2–3 x 9–12 mm. (including awns), tawny or pale, with a few long hairs on the very short pedicel. First and second glumes lanceolate, acute, hispidulous on the keel, first, 2 mm., second 3 mm. long, with a scabrous awn .6 mm.; floral glume 3 mm., naviculate, 3-nerved, with a tuft of stiff hairs at the base and densely ciliate on the margins above with stiff white hairs 2 mm. long, bearing a slightly divergent, scabrous awn, 8–10 mm. long, from the bidentate apex; palea equal in length, rounded at the summit, minutely ciliate on the two nerves; empty glume above the floret 2 mm., truncate, bidentate, bearing a scabrous awn 6–7 mm. long, the rachilla terminated by a second rudimentary glume enclosed in the first. Grain light reddish brown, ellipsoid .5 –.55 x 1.7 mm.; in section compressed trilateral, the angles rounded and facets convex.

Hab.—Sacalum, Sept. 18, 1865, *Schott 632;* "Abundant on stone walls near Izamal, 18 inches high," *Gaumer 1085* (*Chloris barbata* Field Col. Mus. Bot. 1:351), *2172*.

Yucatan specimens have awns and empty glumes longer than typical.

BOUTELOUA Lag. Var. Cienc. 2: pt. 4, 134.

Spikelets 1–2-flowered, numerous, or rarely 1 or 2, crowded and closely sessile in 2 rows along one side of a continuous flattened rachis which usually projects beyond the spikelets; rachilla articulated above the empty glumes and bearing a 3-awned staminate or neuter floret above the single perfect lower one. Empty glumes 2, floral glume 3-nerved, usually 3-awned. Grain elongated, free. Stamens 3.

Spike of a solitary spikelet	*Triæna.*
Spike of several to many spikelets:	
Rachis entire at summit, first glume lanceolate	*Americana.*
Rachis bifid at summit, first glume subulate	*disticha.*

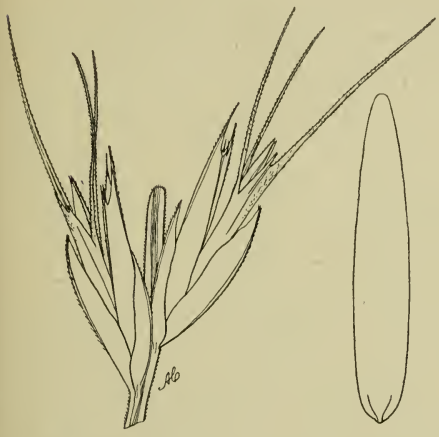
Bouteloua Americana (Sw.) Scribn. Proc. Phila. Acad. Sci. 1891, 306.

Aristida Americana Swartz *non* L. f.

Dinebra repens H. B. K.

Bouteloua bromoides Lag.

Inflorescence exserted, axis 5–10 cm. long, subflexuous, minutely scabrous, internodes 10–20 mm. below, 3–5 mm. toward the summit. Spikes subsecund, ascending on short scabrous pedicels, 1.5–2 cm. long, of 3–10 spikelets, the scabrous rachis continued to a naked slender point. Spikelet 10–12 mm. long; first and second glumes ovate-lanceolate, hispidulous on the keel, acuminate, first 3.8–5 mm., second 4.3–5.7 mm. Perfect floret: floral glume 6–7 mm., sometimes with a tuft of hairs at the base, oval-lanceolate, bidentate, with a scabrous awn 1 mm. long between the teeth; palea 5.6–7 mm., nerves scabrous, bidentate. Staminate floret: floral glume 9–10 mm. (including the erect, scabrous awns), oval-lanceolate, the middle awn longest and having a slender tooth on each side; palea 4.5–6.5 mm., similar to that of perfect floret, enfolding a staminate flower and a rudimentary pistillate flower or an abortive staminate flower or empty (or rarely a perfect flower, the lower floret being pistillate); the rachilla extended in a slender appressed tip back of the palea. Grain ochraceous .7x4.3 mm. Only immature seeds found.



A species "variable in size, habit and number of spikelets, but the floral characters uniform within narrow limits." (S. Watson in Am. Acad. Sci., 1883, p. 178.) The floral characters in specimens examined vary mostly in size of glumes and in having the upper floret either staminate or neuter or (*Schott 659*) in having a pistillate flower below and a perfect flower above. Apparently the species rarely perfects seed in any known habitat.

Hab.—Merida, Sept., Oct. and Nov., 1865, and at ruins of Uzmal, Sept. 16, 1865, *Schott 656, 742, 659;* "brushlands near Izamal, uncommon, 3 feet high," Oct., *Gaumer 1036*, San Anselmo, *1262.* Depauperate specimens from Tekanto, Feb. 28, 1890, *Stone 189* (in Herb. Phila. Acad. Sci.).

Bouteloua disticha (H. B. K.) Benth. Jour. Linn. Soc. 19:105.

Polyodon distichum H. B. K.

Inflorescence included at base, axis 16 cm. long, scabrous, internodes 10–12 mm. below, 3–4 mm. toward the summit. Spikes subsecund, ascending or spreading on short scabrous pedicels, 1.5–1.7 cm. long, of 3–4 spikelets, the hispid rachis continued to a naked bifid

point. Spikelet 15 mm.; first glume 4.3–4.5 mm.; subulate, hispid on the keel; second 7.3 mm., lanceolate, scabrous, the hispid keel much thickened below, extended into a short awn between the teeth of the bidentate apex. Perfect floret: floral glume 6.5 mm., lanceolate, bearing 3 scabrous awns with minute intermediate teeth, middle awn 1 mm., lateral awns 1.5 mm.; palea 5.5 mm., bidentate, nerves scabrous; flower sometimes pistillate only. Neuter floret: floral glume 12–13 mm. including the erect, unequal, scabrous awns, with long scabrous intermediate and lateral teeth; palea none in specimens examined. Grain not seen. "Caryopsis linearis, cylindraceous, glabra." (H. B. K. nov. Gen. et Sp. 1:175, plate 55, fig. 7.)

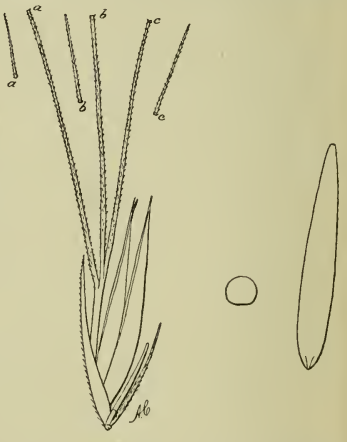
Hab.—Nohcacab, Nov. 24, 1865, *Schott 741.*

Bouteloua Triæna (Spreng), Scribn. Proc. Phila. Acad. Sci. 1891, 307.

Triæna racemosa H. B. K. not *Bouteloua racemosa* Lag.

Atheropogon Triæna Spreng.

Inflorescence short exserted or included at the base, axis 4–10 cm. long, smooth, internodes 1–2 mm. Spikes subsessile, reflexed or spreading, of a solitary spikelet, the rachis continued beyond the spikelet in a scabrous awn-like point longer than the first glume. Spikelet 8–12 mm. long; first glume 2–2.3 mm. linear-oblong, minutely scabrous, obtuse; second glume 4–4.3 mm., lanceolate, acute, sparsely pubescent, scabrous on the keel. Perfect floret: floral glume 6 mm., lanceolate, long acuminate, 3-nerved, scabrous on the keel; palea nearly equal in length, narrowly lanceolate, acuminate, nerves scabrous and extended in two slender teeth. The upper floret reduced to 3 slender, equal, erect or diverging scabrous awns, 9–10 mm. long. Grain stramineous, narrowly lanceolate, .4 x 3 mm.; in section suborbicular.



Hab.—Nohcacab, Nov. 24, 1865, *Schott 740;* top of pyramid of El Castillo, Chichen Itza, Jan. 19, 1895, *Millspaugh, Armour Exped. 135;* "Old fences and low shrubbery upon which it depends for support, 2 feet high, uncommon," Izamal, Aug. *Gaumer 1026,* Chichankanab *1454,* San Anselmo *2142;* Tekanto, Feb 25, 1890, *Stone 210* (in Herb. Phila. Acad. Sci.).

ELEUSINE Gærtn. Fruct. et Sem. 1:7.

Inflorescence of 1–several spikes, digitate or approximate at the summit of the culm. Spikelets several flowered, sessile and closely imbricated in two rows along one side of a continuous rachis which does not project beyond the terminal spikelet, rachilla articulated above the empty glumes. Glumes compressed, keeled, thin but rigid, the first and second and sometimes uppermost empty. Grain triconcave, enclosed in a thin pericarp. Stamens 3.

Eleusine Indica (L.) Gærtn. Fruct. et Sem. 1:8.

Cynosurus Indicus L.

Inflorescence finally exserted, of sometimes a single, usually 2–5 spikes, digitate or one placed 1–2 cm. below the others; spikes 2–9 cm. long, 4–6 mm. wide, bearing 20–50 closely imbricated spikelets; rachis slightly zigzag, narrowly winged, a tuft of tawny hairs at its base. Spikelets 3–5 flowered, 3.2x5.5 mm.. First glume 1.5–1.8 mm., lanceolate, acute, hispid on the green keel; second glume 2.5–3 mm., lanceolate, acute, hispid on the thickened green 5-ribbed keel; floral glume 3 mm., lanceolate, subacute with a thickened, green, 5-ribbed keel; palea 2.5 mm., acute, the narrowly winged nerves distant. Grain black, elliptic, "marked with comb-like lines," .6–.7x1.3 mm.; in section trilobed, dorsal lobe subacute, lateral lobes rounded; pericarp thin.

Hab.—Merida, Aug. and Sept., 1865, *Schott 593a, 738;* "common in gardens as a weed, 5 to 10 inches high," Izamal, Jan. to Dec., *Gaumer 461*, "abundant in shady places 15 inches high," Izamal, *1086*, Chichankanab, *1515, 1525, 1552, 1553*, islands of Holbox and Cozumel, 1885 and 1886 (B), Calotmul *2449*.

DACTYLOCTENIUM Willd. Enum. Hort. Berol. 1029.

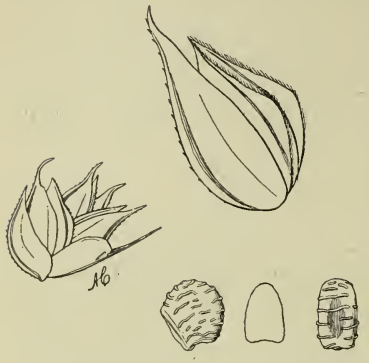
Spikelets several flowered, the uppermost imperfect, sessile and crowded in two rows along one side of a continuous rachis which is extended to a naked point, forming unilateral spikes, these digitate at the summit of the culm; rachilla articulated above the empty glumes and between the florets. Glumes compressed, keeled, membranaceous, first and second empty. Grain laterally compressed, enclosed in a thin, loose pericarp. Stamens 3.

Dactyloctenium Ægyptium (L.) Willd. *ibid.*

Cynosurus Ægyptius L.

Inflorescence exserted, of 2–4 digitate spikes 1.5–4 cm. long, 6–7 mm. wide, bearing 24–70 densely crowded spikelets; rachis narrowly winged, hispid at least on the naked cuspidate summit. Spikelets 3.5x3.5 mm., 2-flowered with 2 rudimentary florets above. First

glume 2.4 mm., naviculate with a short cuspidate point, hispid on the prominent, green-bordered keel; second glume 2 mm. (excluding point), broad, truncate or emarginate, the hispid keel extended into a cuspidate point 1.3 mm. long; floral glume 3 mm., naviculate, the prominent green-bordered, hispid keel extended into a cuspidate point which in the lower floret is inflexed at the tip, in the second the point is usually straight; palea 2.3 mm., broad acute, deeply folded between the ciliate-winged nerves. Grain light reddish brown, broadly oblong, transversely wrinkled, .5–.8 x .9 mm.; in section conoid, with a concave ventrum.



Hab.—Merida, Aug. 20 to Sept. 5, 1865, *Schott 734;* Progreso, *Gaumer 1509*, Izamal *2171*.

LEPTOCHLOA Beauv. Agrost. 71, t. 15, f. 1.

Spikelets several flowered, perfect, short-pediceled, in two rows along one side of the slender numerous branches of a simple panicle, rachilla articulated above the empty glumes and between the florets. Glumes compressed, keeled, thin, first and second empty. Grain sub-trilateral, free. Stamens 3.

Spikelets 3–3.5 mm., floral glume entire, awnless	*mucronata.*
Spikelets 8–9 mm., floral glume bidentate, awned	*fascicularis.*

Leptochloa mucronata (Michx.) Kunth Gram. 1:91.

Eleusine mucronata Michx.

Inflorescence included at the base or finally exserted, 25–40 cm. long, 5–10 cm. wide, comprising 25–40 very slender, racemed, ascending spikes, 6–15 cm. long, 2–3 mm. wide, of 30–50 alternate, spreading spikelets; rachis slightly zigzag, angled, hispidulous, internodes 1.5–2 mm. Spikelets 1.5 x 3.2 mm., compressed, loosely 4–5-flowered, on short scabrous pedicels, rachilla smooth, flexuous, joints .5 mm. First and second glumes subequal 1.8–2 mm., linear-lanceolate, acute, mucronate-tipped, hispid on the keel; floral glume 1.3–1.5 mm., ovate, obtuse or emarginate, 3-nerved, silky ciliate on the nerves; palea 1.3 mm., oblong, obtuse silky ciliate on the nerves; the rachilla produced in a short point at the back of the terminal (staminate) floret. Grain translucent reddish-brown, lanceolate, smooth, .25–.4 x 1.1 mm.; in section narrowly cordate.

Hab.—Environs of Merida, May, 1865, *Schott 401;* July, 1865, *590;* Nov., 1865, *739;* common in old fields about Izamal, 3 feet high,

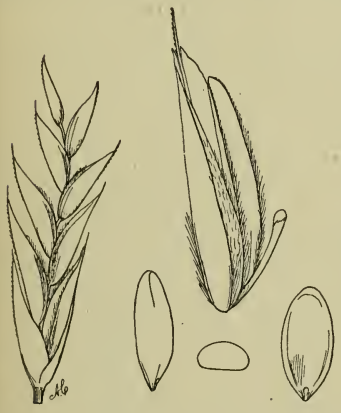
Sept., *Gaumer 853*, Chichankanab *1998*, *2463*, San Anselmo, *1999*, forests of Buena Vista Xbac, 18 inches high, common, Sept. *2283*, *2327*.

Nos. *1999* (in part), *2283* and *2327 Gaumer*, and *401*, *590* and *739 Schott*, are a smaller form with narrower leaves, the inflorescence more exserted, and spikes somewhat spreading, but no difference in the spikelets can be found, and some of the larger specimens show characters approaching those of the smaller, the basal branches (when present) bearing the narrow leaves.

Leptochloa fascicularis (Lam.) A. Gray Man. Bot. 588.

Festuca fascicularis Lam.

Inflorescence included at base or finally exserted, 10–15 cm. long, 2–4 cm. wide, of 10–25 or more slender, erect or ascending spikes, 3–8 cm. long, 5 mm. wide, of 20–30 alternate, ascending spikelets; rachis angled, scabrous, internodes 4–8 mm. Spikelets 2.5–3 x 8–10 mm., loosely 4–10-flowered, on short scabrous pedicels, rachilla smooth, terminating in an empty glume, joints .7–.8 mm. First and second glumes lanceolate, acuminate, scabrous on the keel, first 2.2–2.8 mm., second 3–3.5 mm. long; floral glume 4–5 mm., lanceolate, 3-nerved, margins and lateral nerves appressed silky pilose below, midnerve pilose below and prolonged into a scabrous awn, .5–.8 mm. long, between the two slender teeth of the apex; palea nearly equal, elliptic, obtuse, appressed silky pilose on the nerves. Grain reddish brown, oval, narrowed at the base, 7 x 1.5 mm.; in section plano-convex.



Hab.—Chichankanab, *Gaumer 1568*.

Yucatan specimens have spikelets and floral glumes somewhat smaller than typical forms.

GOUINIA Fourn. Mex. Pl. Enum. Gram. 103.

Spikelets 3–4 flowered, perfect, slender pediceled in two rows along one side of the branches of an ample, spreading panicle; rachilla articulated above the empty glumes and between the florets. Glumes compressed, keeled, first and second empty; floral glumes with a hairy callus, bidentate, awned. Grain long elliptic, sulcate down the ventrum. Stamens 3.

Awns 4.5–5.5 mm., grain black, rugose	*latifolia.*
Awns 8–10 mm., grain wine-color, smooth	*virgata.*

Gouinia virgata (Presl.) Scribner U. S. Dept. Agr. Div. Agrost. Bull., 4, 10.

Bromus virgatus Presl.

Gouinia polygama Fourn.

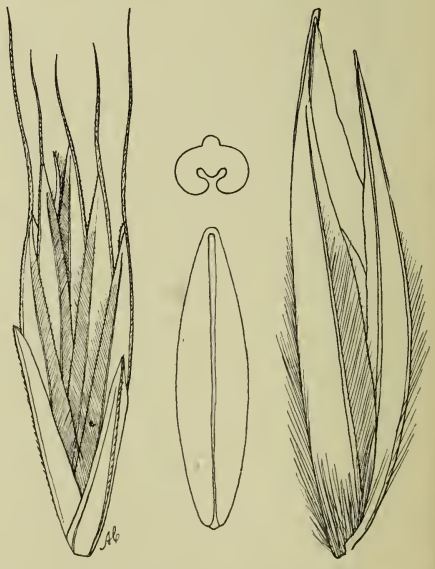
Panicle exserted, loose and open, 35–40 cm. long, 20–30 cm. wide, branches alternate or subfasciculate, compound, slender, spreading or drooping, swollen and tawny-tomentose in the axils; axis and rachis scabrous. Spikelets 2.5 x 15–18 mm., 3–4 flowered, pale brownish green, on slender pedicels 2–3 mm. long; joints of the rachilla 2 mm. First glume 4.2 mm., lanceolate, acuminate, hispidulous on the midnerve and margins above, 3-nerved; second 5.2 mm., lanceolate-ovate, acute, 5-nerved, hispidulous on the midnerve and margins above; floral glume 8 mm. (excluding awn), lanceolate, acuminate, bidentate, 3-nerved, pilose below, hispidulous on the midnerve above, awn erect, 8–10 mm., slender, scabrous; palea 6.3 mm., lanceolate, bidentate, pilose on the nerves and margins. Grain wine-color, smooth, lanceolate-ellipsoid, .9 x 3.7 mm.; in section cordate.

Hab.—Tekax, Sept. 1895, *Gaumer 1033*.

Gouinia latifolia (Griseb.) Vasey Contrib. Nat. Herb. 1:365.

Tricuspis (*Neuroblepharum*) *latifolium* Griseb.

Panicle exserted, loose and open, 25 cm. long, 18 cm. wide, branches subfasciculate, slender, spreading or ascending, swollen but glabrous in the axils; axis and rachis minutely scabrous above. Spikelets tawny, 3.1 x 12–15 mm., 3–4-flowered, on slender pedicels 1–3 mm. long; joints of rachilla 1 mm. First and second glumes lanceolate, 3-nerved, hispidulous on the midnerve; first 5–5.5 mm. acuminate, second 6.3 mm., obtuse; floral glume 7 mm. (excluding awn), lanceolate, acute, bidentate, 3-nerved, long-pilose on the nerves and marginal spaces, midnerve hispidulous above, awn erect, 4.5–5.5 mm., slender, scabrous; palea 6 mm., lanceolate, bidentate, hispidulous on the nerves and teeth. Grain dull black, rugose, narrowly ellipsoid, 1 x 4 mm.; in section elliptic with a bilobed excavation on the ventrum.



Hab.—Nohcacab, Nov. 25, 1865, *Schott 703*. (Schott's *594* from the aguada de Labcah, July, 1865, without inflorescence, is probably this species. He applies the Yucatec name Cañote.)

ARUNDO L. Sp. Pl. 120.

Inflorescence paniculate. Spikelets 2–several flowered, perfect, or the upper or lower sometimes staminate; rachilla articulated above the empty glumes and between the florets, smooth. Empty glumes 2, floral glumes thin, membranaceous, bidentate, cuspidate between the teeth, long pilose on the back. Grain dorsally compressed, free. Stamens 3.

Arundo Donax L. Sp. Pl. 81.

Panicle included at base or finally exserted, contracted, densely flowered, 50–60 cm. long, 6–10 cm. wide, branches fasciculate, compound, erect, spikelet-bearing on the upper half, or on lower branches to near the base; branches hispidulous. Spikelets tawny, 6–7 x 12–14 mm., 4-flowered on pedicels 2–5 mm. long, joints of rachilla 1 mm. long. First glume 10–11 mm., narrowly lanceolate, acuminate, 5-nerved; second, 10–12 mm., narrowly lanceolate, acuminate, sometimes with a slender tooth each side of the apex (formed by the glumes splitting at the lateral nerves), 3-nerved; floral glumes 10–13 mm., lanceolate, bidentate, with a cuspidate point between the teeth, 3–5 nerved, the lower part of glume clothed with silky, smoky-white hairs 7–8 mm. long; palea 5 mm. oblong-lanceolate, truncate, ciliolate on the two nerves. Grain rusty black, oblanceolate .8 x 2.2 mm.; in section unequally biconvex.

Hab.—Common on the coast, in aguadas, cenotés and often cultivated, Progreso, *Gaumer 1141*.

PHRAGMITES Trin. Fund. Agrost. 134.

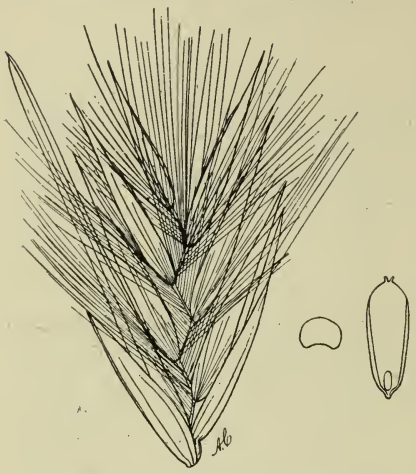
Inflorescence paniculate. Spikelets 2–several flowered, the lowest floret staminate or neuter, those above perfect; rachilla articulated above the empty glumes and between the florets, clothed with long silky hairs. Empty glumes 2, floral glumes thin, membranaceous, entire, glabrous. Grain dorsally compressed, free. Stamens 3.

Phragmites vulgaris (Lam.) B. S. P. Prel. Cat. N. Y. 69.

Arundo vulgaris Lam.

Panicle included at base or finally exserted, densely flowered,

30–50 cm. long, 10–15 cm. wide, branches subfasciculate, compound, ascending, spikelet-bearing to near the base, axis and rachis scabrous on the angles. Spikelets tawny, 5–6 x 13–14 mm., 5–7 flowered on pedicels 2–5 mm. long; joints of rachilla 1 mm., clothed with white silky hairs 10 mm. long. First glume 5 mm., lanceolate, acute, 5-nerved; second 6–8 mm., lanceolate, acuminate, 3-nerved; lowest floral glume 10–12 mm., narrowly lanceolate, acute, 3-nerved, subtending a palea 4 mm. long and a staminate flower; glumes of perfect flowers 6 mm., lanceolate, subacute, 3-nerved; palea 4 mm., acute, hispidulous on the nerves. Grain reddish brown, obovate oblong, mucronate, .6 x 1.5 mm.; in section convexo-concave.



Hab.—Chichankanab, *Gaumer 1355*.

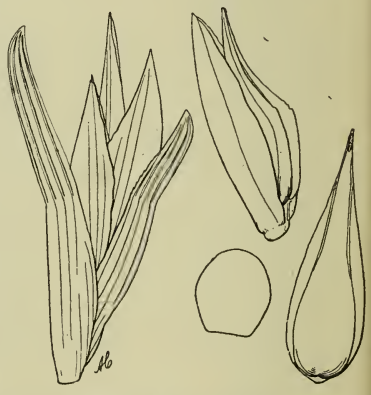
The species apparently rarely perfects seed.

MONANTHOCHLOË Engelm. Trans. St. Louis Acad. Sci. 1:436.

Plants dicœcious, 2–3 flowered, spikelets usually sessile in pairs and concealed in the axils of the crowded, short, rigid upper leaves. Grain subterete. Stamens 3.

Monanthochloë littoralis Engelm. *ibid.*

Staminate spikelets 2 x 8 mm., empty glumes leaflike, rigid, with membranaceous sheaths and short veiny squarrose blades, 8–10 mm. long, floral glume 6–7 mm., membranaceous, ovate, obtuse, 3-nerved, nerves prominently 3-ribbed; palea shorter, hyaline, lanceolate, truncate or denticulate, pubescent on the two nerves. Pistillate spikelets 2.2 x 8 mm., empty glumes like those of staminate spikelets; floral glume rigid, 6–7 mm., broadly ovate, obtuse, 3-nerved as in staminate floret but less prominently; palea equal in length, ovate, acuminate, the nerves broadly winged below. Grain dull brown, lanceolate, 1–1.1 x 3.4 mm.; in section rounded hexagonal, the ventrum slightly concave.



Hab.—Abundant at the port of Silam, 2 feet high, April, 1895, *Gaumer 624, 1880*.

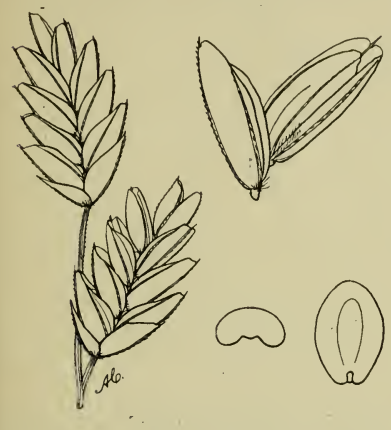
TRIODIA R. Br. Prod. Fl. Nov. Holl. 182.

Inflorescence an open branching panicle. Spikelets nearly terete, several flowered, perfect, or uppermost floret staminate; rachilla

articulated between the florets. Empty glumes 2, floral glumes membranaceous, 3-nerved, bidentate, cuspidate between the teeth. Grain dorsally compressed, free. Stamens 3.

Triodia eragrostoides Vasey & Scribn. Contr. U.S. Nat. Herb. 1:58.

Panicle finally exserted, loose and open, 15–25 cm. long, 10–12 cm. wide, branches distant, slender, ascending or spreading at maturity, axis and rachis scabrous, at least above. Spikelets 2.8 x 5–5.5 mm., 7–10-flowered, on slender scabrous pedicels, 1 to many times their own length; joints of the rachilla .4–.5 mm., short pilose; first glume 1.8 mm., lanceolate, acuminate, strigose, hispid on the keel; second 2.5 mm., broadly ovate, abruptly acuminate, strigose, hispid on the keel; floral glume 2.2–2.5 mm., truncate or emarginate, cuspidate, ciliolate at the apex, strigose, pubescent on the margins and nerves below; palea 2 mm., ciliolate at the truncate apex, pubescent on the nerves. Grain dull brown, oblong-obovate, .9 x 1.3 mm.; in section reniform.



Hab.—Silam, *Gaumer 1239*, "A lax form," F. Lamson-Scribner.

ERAGROSTIS Host. Ic. Gram. 4:14.

Inflorescence paniculate. Spikelets laterally compressed, few to many flowered, perfect; rachilla articulated above the empty glumes and between the florets, but sometimes not breaking up until after the fall of the fruiting glumes. Empty glumes 2, floral glumes membranaceous, 3-nerved, awnless. Grain terete or little compressed laterally, free. Stamens 3.

Spikelets 16–30-flowered	*amœna.*
Spikelets not more than 10-flowered:	
Keels of palea hispid	*Mexicana.*
Keels of palea long ciliate:	
Grain smooth and shining, panicle dense, contracted	*ciliaris.*
Grain longitudinally striate, panicle loose and open	*plumosa.*

Eragrostis plumosa Link Hort. Berol. 1:192.

Panicle long exserted, loose and open, 7–13 cm. long, 2–5 cm. wide, axis and rachis scabrous at least above; branches ascending or somewhat spreading at maturity. Spikelets 2.5 x 3–3.5 mm., loosely 8–10 flowered, grayish green, on slender pedicels ½ to twice their own length; joints of the rachilla 2 mm. articulated, leaving persistent

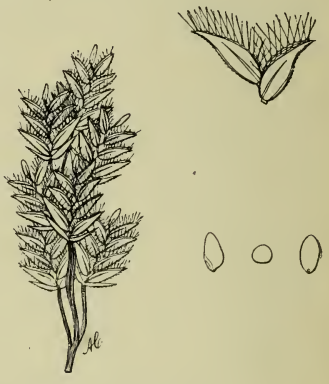
paleæ after fruit and glumes have fallen. First and second glumes ovate, acute, hispid on the keels, first 1 mm., second 1.3 mm.; floral glume 1.1–1.3 mm. abruptly acute, hispid on the keel, minutely strigose, palea 1–1.1 mm., acute, papillo-ciliate on the winged keels. Grain translucent reddish-brown, ellipsoid, acutish at each end, longitudinally striate with wavy lines, .25x.6 mm.; in section orbicular.

Hab.—Quinta del Obispo, Nov. 24, 1864, and Sept. 5, 1865, *Schott 59;* common in open lands near Izamal, 12–14 inches high, June to Jan. *Gaumer 313* (*Eragrostis Mexicanus* Field Col. Mus. Bot. 1:288), Yucatan *loc ignot 851* (*Eragrostis ciliaris* Field Col. Mus. Bot. 1:351), Chichankanab *1567*. "Too delicately rooted to form pasture. It is readily pulled up by grazing cattle;" damp soil near the Caleta, Island of Cozumel, *Millspaugh Pl. Utowanæ 1528*.

Eragrostis ciliaris (L.) Link Hort. Berol. 1:192.

Poa ciliaris L.

Panicle included at the base or finally exserted, dense, cylindrical, more or less interrupted toward the base, 4–12 cm. long, .5–1 cm. wide, branches short, erect or nearly so, axis and rachis scabrous. Spikelets 1.6x2–3 mm., loosely 7–10-flowered, pale brownish-green, on slender pedicels ¼ to equal their own length; joints of the rachilla .15 mm. articulated, falling with the fruit and glumes. First and second glumes ovate, acute, cuspidate, hispid on the keels, first .9 mm., second 1.2 mm.; floral glume 1.1–1.3 mm., acute, mucronate, hispid on the keel, strigose; palea .9–1 mm., acute, papillo-ciliate on the winged keels. Grain reddish-brown, translucent, ellipsoid, obtuse at each end, smooth and shining, .25x.5 mm.; in section depressed orbicular.



Hab.—Merida at Quinta del Obispo, Nov. 24, 1864, and ruins of Uxmal, Sept. 16, 1865, *Schott 20*, Merida, Sept. 5, 1865. *619;* on open lands, 10 inches high, *Gaumer 312*, very abundant along roadsides near Izamal, 6 inches high, July to March, *356*, Chichankanab, *2252*. "Forms fair pasturage in favorable soil, though no attempt has been made to cultivate the species;" Tekanto, Feb. 27, 1890, *Stone 187* (in Herb. Phila. Acad. Sci.).

Eragrostis amœna Presl. in Rel. Hænk. 1:275.

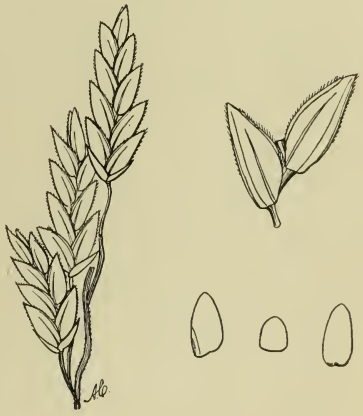
Panicle exserted, contracted, stiff, 3-12 cm. long, 1–1.2 cm. wide, axis and rachis scabrous, branches short, erect. Spikelets 3x10–15 mm.,

dense, 16–30-flowered, pale green tinged with purple or brown, on flattened pedicels 1 mm. long or less; joints of rachilla .3 mm. long, articulated, falling with the fruit and glumes. First and second glumes lanceolate, acuminate, hispid on the strong keels, first 1.5–2 mm., second 2–2.3 mm.; floral glume 2.2–2.6 mm., acuminate, hispid on the keel; palea 2–2.2 mm., acuminate, hispid on the winged keels. Grain reddish-brown translucent, narrowly ovoid, minutely longitudinally striate; .3–.4x.7–.9 mm.; in section obovate, with truncated plane ventrum.

Hab.—Sea shore, Sisal, Oct. 24, 1865, *Schott 640*, this specimen has panicles 12–13 cm. long with long erect branches, and spikelets on pedicels 2–3 mm. long (published in Field Col. Mus. Bot. 1:351 as *Eragrostis elongata* Jacq.), but floral glumes and grain agree with those of E. amœna Presl.; San Anselmo *Gaumer 1207*, Chichankanab, *2249*, *2251*.

Eragrostis Mexicana Link Hort. Berol. 1:190.

Panicle exserted, loose and open, 6–13 cm. long, 3–7 cm. wide, axis and branches scabrous at least above; branches ascending, very slender, somewhat flexuous. Spikelets 1.5x4–4.5 mm., dense, 7–9-flowered, pale or grayish green, on capillary pedicels 1 to 2 times their own length or more; joints of the rachilla .5 mm. long articulated, leaving the persistent paleæ after fruit and glumes have fallen. First glume .8–.9 mm., ovate, acute, keeled, glabrous; second glume ovate, acute, 1–1.2 mm., hispidulous on the keel; floral glume 1.4–1.6 mm., acute, hispidulous on the keel; palea 1.2 mm, acute, hispid on the keels. Grain brownish red, translucent, ovoid, minutely longitudinally striate, .4x.8 mm.; in section conoidal with convex ventrum.



Hab.—Chichankanab, *Gaumer 1260*, Izamal, *2471*, *2480*, *2486*.

DISTICHLIS Raf. Journ. Phys. 89:104.

Plants diœcious, spikelets several flowered, compressed in short, contracted panicles. Staminate and pistillate spikelets similar, but the staminate usually larger. Empty glumes 2, floral glume membranaceous, rigid, 5–9 nerved, awnless. Grain laterally compressed,

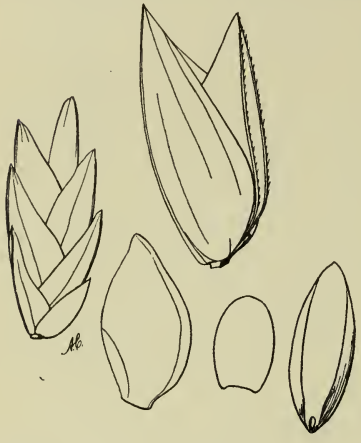
closely enfolded in the thickened coriaceous base of the palea, free. Stamens 3.

Distichlis spicata (L.) Greene Bull. Calif. Acad. Sci. 2:415.

Uniola spicata L.

Distichlis maritima Raf.

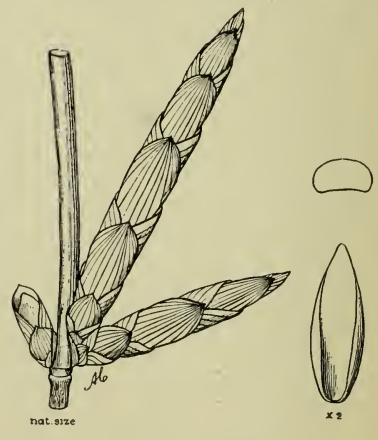
Panicle finally exserted, contracted, 3–5 cm. long, 1–1.5 cm. wide; axis and rachis minutely scabrous. Staminate spikelets 5–6 x 10–12 mm., densely 7–13-flowered, on pedicels 1–3 mm. long; joints of rachilla .6 mm. First glume 2 mm., ovate, obtuse, obscurely 5-nerved; second glume 3 mm., ovate, acute, obscurely 5-nerved, hispidulous on the keel above; floral glumes 4–4.3 mm., ovate, acute, 9-nerved (the nerves in 3's); palea equal in length, deeply folded between the hispidulous nerves. Pistillate spikelets 2.7 x 6–6.5 mm. densely 4–5-flowered, on pedicels 1–3 mm. long; joints of rachilla .4 mm. First glume 2 mm., ovate, subacute, 5-nerved; second glume 3 mm., broadly ovate, abruptly acute, obscurely 5-nerved, hispidulous on the keel above; floral glumes 3.5–3.7 mm., broadly ovate, acute, 9-nerved (nerves in 3's); palea nearly equal, deeply folded between the hispidulous nerves. Grain dull brown, elliptic, acute at each end, 1.2 x 2.3 mm.; in section oval with concave truncate ventrum.



Hab.—Celestun, May 13, 1865, *Schott 494;* Progreso, *Gaumer 2496.*

GUADUA Kunth Syn. Pl. 1:252.

Spikelets several to many flowered, terete or little compressed, glomerate or fasciculate; lower florets staminate or neuter, the others perfect. Empty glumes several; floral glumes rigid, subcoriaceous. Grain dorsally compressed, enclosed in the fruiting glumes, free. Stamens 6.



Guadua latifolia Kunth Syn. Pl. 1:254.

Spikelets sessile in half whorls or fascicles at the nodes of the branches of the panicle; internodes 2–10 cm. long, tomentose below the nodes. Spikelets 2.5–6 cm. long, 5–6 mm. wide, 5–9-flowered, cylindric, sub-arcuate; rachilla articulated between the florets, internodes 5 mm. long, flattened. Empty glumes 4–6 or more, broadly triangular, many

nerved, puberulent above, mucronate tipped; floral glume 12–16 mm. long, ovate, many nerved, minutely puberulent above, mucronate pointed; paleæ equal, ovate, rounded or subacute, many nerved, pubescent on the back, the broadly winged keels and apex short ciliate; lodicules 8 mm. long. Grain light brown, lanceolate, acute, 3.5 x 10.5 mm.; in section convexo-concave.

Hab.—Merida, Jan., 1866, lacking inflorescence, *Schott num. amiss.* Figure drawn from specimen from Turbo, March 20, 1858, *Schott.*

Under number *547* Dr. Schott collected from the gardens of San Rafael de Xteppen an Andropogon without inflorescence.

CYPERACEÆ.*

CHARLES F. MILLSPAUGH AND AGNES CHASE.

Grass-like or rush-like herbs. Inflorescence in solitary or clustered 1–many flowered spikelets; flowers perfect or imperfect, 1 or rarely 2 in the axil of each glume; scales 2-ranked or spirally imbricated. Perianth hypogynous, composed of interior scales or bristles, or wanting. Stamens 1–3, rarely more. Ovary 1-celled, sessile or stipitate, ovule 1, anatropous, erect, style 2–3-cleft or minutely 2-toothed, rarely simple. Fruit a plano-convex, lenticular, trilateral or subglobose achene:

- Spikelets all alike, fertile flowers perfect (except Cyperus canus):
  - Glumes 2-ranked — *Cyperus.*
  - Glumes spirally imbricated:
    - Spikelets several to many-fruited:
      - Achene tuberculate:
        - Perianth of bristles — *Heleocharis.*
        - Perianth none — *Dichromena.*
      - Achene not tuberculate:
        - Bilateral, achene sessile:
          - Perianth of bristles — *Scirpus.*
          - Perianth none — *Fimbristylis.*
        - Trilateral, achene stalked — *Fuirena.*
    - Spikelets 1–2-fruited:
      - Achene tuberculate, style 2-fid — *Rhynchospora.*
      - Achene not tuberculate, style 3-fid — *Cladium.*
- Spikelets unisexual, achene osseous — *Scleria.*

CYPERUS L. Sp. Pl. 44.

Including *Mariscus* and *Torulinium.* Inflorescence in more or less densely disposed subumbellate spikes. Fertile flowers bisexual (except in C. canus). Rachilla winged or wingless; spikelets few to many-fruited; scales distichous, the lower two empty; bristles none. Stamens 1–3. Style 3-cleft, achene trilateral:

- Rachilla persistent, glumes deciduous:
  - Flowers perfect:
    - Spikelets digitate or congested on a reduced rachis:
      - Achene oblong-turbinate, markings of longitudinal impressed lines — *uncinatus.*
      - Achene obovoid, hexagonally reticulated — *ochraceus.*
      - Achene pyriform with lozenge-shaped reticulations — *elegans.*
    - Spikelets spicate:
      - Achene broad-turbinate, reticulated and papillate — *compressus.*
      - Achene oblong, hexagonally reticulated:
        - Reticulations conspicuous, interspaces convex — *esculentus.*
        - Reticulations faint, interspaces concave — *rotundus.*
  - Flowers unisexual — *canus.*

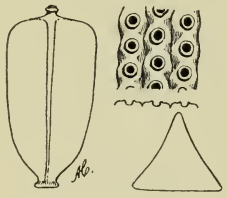
*The cuts present an enlargement of the achene, dorsal view (also lateral view in some cases) magnified 20 diameters, a transverse section at its greatest diameter (the base of the section being the ventral side), a portion of the surface magnified, showing the markings, and usually beneath this a cross-section of the same, illustrating their prominence.

Rachilla falling away from the axis, slightly winged:	
Achene equilateral or nearly so:	
Facets convex, angles round-margined	*echinatus.*
Facets concave, angles sharp	*ligularis.*
Achene dorsally compressed	*bruneus.*
Rachilla breaking up in 1-fruited nodes, the broad wings clasping the achene:	
Achene much compressed dorsally, 1.4 mm. long	*Michauxianus.*
Achene little compressed, 1.8 mm. or more:	
Facets all concave, reticulations pitted	*lentiginosus.*
Dorsal facets plane, ventral concave, reticulations papillate.	*ferax.*

§*EUCYPERUS.*—Spikelets compressed; rachilla persistent on the axis, glumes deciduous.

Cyperus uncinatus Poir. in Lam. Encyc. 7:247.

Bracts 3–4, leaf-like, 2–10 cm. long. Inflorescence a 2–5-rayed umbel, 1 spike sessile (inflorescence sometimes reduced to the single sessile spike), rays .5–4.5 cm. long. Spikes russet to chestnut, dense flabellate, 1–1.7 cm. wide, composed of 6–25 spikelets divergent from the reduced rachis. Spikelets compressed, oblong, 4–5 x 6–12 mm., 5–16 fruited, rachilla wingless. Glumes less than twice the length of the achene, naviculate, ovate-oblong, abruptly tapering into a squarrose smooth awn ½ its own length, prominently 9–11-nerved. Stamen (in our specimens) 1, lateral, ("*Staminibus 3-1*," Clarke in Urb. Symb. 2:24.) Style longer than the achene, divided ½ its length. Achene dull black, oblong-turbinate, .4–.5 x 1.1 mm., in section triangular, ventral facet plane, dorsal facets slightly concave, marked by wavy longitudinal impressed lines including single rows of circular pits with prominent lips.



Hab.—Mangrove swamp, Sisal, and near Merida, *Schott, sine num.*, Cerañas, Merida, Sept. 15, 1864, *77*, Sisal, Nov. 9, 1865, *908a*; Cerro de Maxcaan, Sept. 14, 1865, *910;* "6 to 10 inches high, common in old fields, Oct.," Izamal, *Gaumer 1023* (*Cyperus squarrosus* Field Col. Mus. Bot. 1:354), San Anselmo *2426*.

The plant is called X-CHABXAN, "Like a woman's greased hair," by the Mayas.

Cyperus canus Presl. in Rel. Hænk. 1:170.

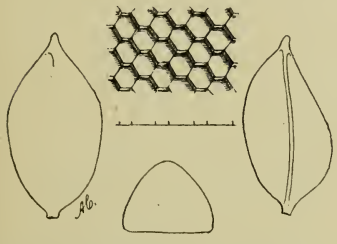
Bracts 12–15, leaf-like, 20–30 dm. long. Inflorescence an open, many-rayed corymbose umbel; rays slender, 6–12 cm. long; corymbs 4–8 cm. in diameter, bractlets ovate, .5–1 cm. Spikes of 2–6 spikelets, digitate from the reduced rachis. Spikelets dicœcious, compressed, 2–3 x 10–15 mm.,

20–30 flowered, oblong, grayish chestnut; rachilla wingless. Glumes closely imbricated, broadly ovate, mucronate, 2 mm. long, 3-nerved, reddish brown with green keel and white margins. Style as long as the glume, stigmas exserted. Achenes undeveloped in specimens seen, ⅓ the length of the glume, brown, ovoid, triangular, the ventrum broadest and slightly concave.

Hab.—Aguada Xcholac, March, 1866, *Schott 563;* "common on the borders of cenotés near Izamal, 3 feet high," *Gaumer 483.*

Cyperus ochraceus Vahl Enum., 2:325.

Bracts leaf-like, 1–4 dm. long. Inflorescence a decompound umbel, rays 6–10, 2–5 cm. long; secondary umbels 2–4-rayed, rays 2 cm. long; bractlets 5–10 mm. long. Spikes pale-ocher, subglobose, 1 cm. wide, having 10–20 spikelets subdigitate from the reduced rachis. Spikelets strongly compressed, ovate-oblong, 2 x 5–10 mm., 18–20 fruited; rachilla wingless. Glumes ocher with a broad, green dorsal stripe, loosely cellular, ovate, acute, subapiculate, closely imbricated, keeled above but hollow below from the pressure of the adjacent achene; 3-veined, the midvein forking to border the depression; scale a little longer than the achene. Stamen 1, lateral. Style subciliate, shorter than the achene, divisions short. Achene brown, ovoid, .5–.6 x 1.2 mm., in section triangular, the dorsal angle very bluntly rounded, the dorsal facets convex, the ventral plane, all marked by regular, sharp hexagona reticulations rising perpendicular to the surface of the achene.

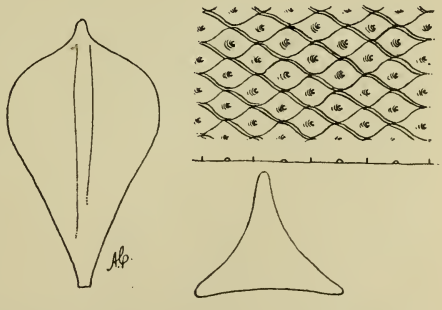


Hab.—Aguadas and cenotés, Nabulá, Hacienda Chablé, Aug. 8, 1865, *Schott 568;* abundant on open lands near Izamal, *Gaumer 388, 1028;* in shallow standing water in field at the Caleta, Island of Cozumel, *Millspaugh Pl. Utowanæ 1519.*

Cyperus elegans L. Sp. Pl. 2:68.

Cyperus viscosus Sw.

Bracts 3, leaf-like, 2–3 dm. long. Inflorescence a 6–10-rayed umbel, one spike sessile, rays 1–6 cm. long. Spikes mottled pale-green and brown, subglobose, composed of 8–20 spikelets divergent from the reduced rachis. Spikelets compressed, oblong, 3 x 8–10 mm., 10-fruited; rachilla wingless. Glumes fuscous to chestnut with pale green margins and midvein, suborbicular, mucronate, less than twice the length of the achene, obliquely spreading; keel thickened at the apex, expanding into 7 nerves below. Stamens 3. Style shorter than the achene, divided to near the base.

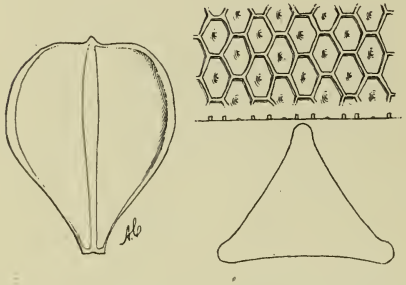


Achene black, pyriform, .9 x 1.7 mm., in section triangular, the facets all equally concave and marked by horizontal reticulations resembling a net, the meshes each including a single slight papilla.

Hab.—Izamal, *Gaumer 2329, 2485, 2492,* common at San Felipe, *1403;* east shore of island of Cozumel, Feb. 21, 1899, *Millspaugh Pl. Utowanæ 1596,* Progreso, March 5, 1899, *1686.*

Cyperus compressus L. Sp. Pl. Ed. 2:68.

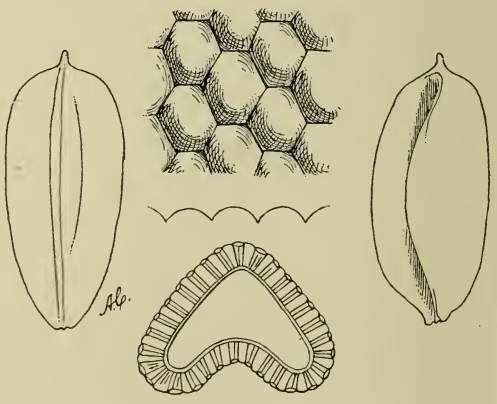
Bracts 4–5, leaf-like, 2–16 cm. long. Inflorescence a 2–5-rayed umbel, 1 spike sessile, rays 1–5 cm. long. Spikes green, more or less mottled with chestnut at maturity, flabellate, 12–25 cm. wide, composed of 3–10 spikelets, spreading or ascending from the short rachis. Spikelets compressed, oblong, 2 x 8–20 mm., 6–30-fruited; rachilla flattened, wingless. Glumes more than twice the length of the achene, green, with pale or chestnut margins, closely imbricated, naviculate, broadly ovate, acuminate, mucronate, keel thickened, lateral nerves obscure. Stamens 3. Style longer than the achene, divisions short. Achene shining dark chestnut or nearly black, turbinate, .9–1 x 1.3 mm.; in section triangular, the angles with prominently rounded margins, the facets slightly concave, marked by faint, regular, hexagonal ridges, the interspaces plane and including a single slight papilla.



Hab.—Chichankanab, *Gaumer 1291.*

Cyperus esculentus L. Sp. Pl. Ed. 2, 67.

Bracts 2–5, leaf-like, 4–20 cm. long. Inflorescence a 4–10-rayed umbel, rays .5–6 cm. long. Spikes golden brown, flabellate-oblong, 2–3 cm. wide, of 5–25 spreading spikelets; rachis .5–2.5 cm. long; bractlets, when present, setaceous. Spikelets compressed, oblong, 2–2.5 x 10–15 mm., 8–14-fruited; rachilla hyaline winged. Glumes twice the length of the achene, ovate, obtuse, hyaline margined at summit, strongly 9–11-nerved, golden brown, faintly streaked with chestnut. Stamens 3. Style more than twice the length of the achene, divided ⅔ its length. Achene shining light golden brown, obovoid-oblong, .7 x 1.7 mm.; in section reniform-triangular,



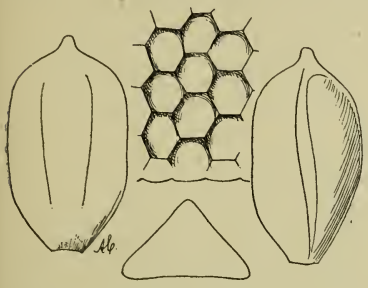
with a prominent border of deep irregularly hexagonal air cells overlying the hard endocarp. This layer of air cells gives to the achene a translucent, "bubbly" appearance.

Hab.—Chichankanab, *Gaumer 1511, 2451.*

The species, though flowering abundantly, rarely perfects its achenes.

Cyperus rotundus L. Sp. Pl. Ed. 2, 67.

Bracts 3–5, leaf-like, 1–11 cm. long. Inflorescence a 3–7-rayed umbel, 1 spike subsessile, rays 1–7 cm. long, sometimes compound.



Spikes wine-color, flabellate-oblong, 2–3 cm. wide, of 2–7 spreading spikelets, rachis 2–10 mm. long. Spikelets compressed, oblong, 1.5–2x5–20 mm., 6–24-fruited; rachilla hyaline winged. Glumes twice the length of the achene, ovate, obtuse, strongly 5–7-nerved, wine-color, with an olive-green keel. Stamens 3. Style 3 times the length of the achene, divided ½ its length. Achene ashy brown (reddish when immature), oblong, .6–.7x1.4 mm.; in section depressed triangular, the ventral facet broadest and slightly concave; the marking similar to that of esculentus but air cells much shallower and interspaces sunken.

Hab.—"Common in moist places near Merida, 1 foot high," *Gaumer 1087, 1088*, Chichankanab, *2173*.

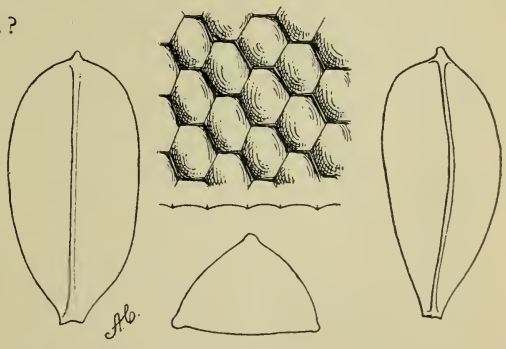
This species, like the preceding, rarely perfects fruit, both reproducing by tubers.

§*MARISCUS.*—Characters of *Eucyperus* except: rachilla slightly winged, falling away from the axis, two lower empty glumes persistent.

Cyperus echinatus (Ell.) Wood Class Book 734.

Mariscus echinatus Ell.

Cyperus globulosus Aubl.?



Bracts 2–5, leaf-like, 2–10 cm. long. Inflorescence a 1–8-rayed umbel, 1 spike sessile (inflorescence sometimes reduced to the single sessile spike), rays .5–3 cm. long. Spikes russet, subglobose, 8–12 mm. wide, of 10–25 congested spikelets on a reduced rachis. Spikelets little compressed, oblong 2x6 mm., 3–4-fruited; rachilla broadly hyaline winged. Glumes less than twice the length of the achene, ovate, obtuse, minutely speckled

with chestnut, strongly 9–11-nerved. Stamens 3. Style equal to the achene, divided ½ its length. Achene fuscous, obovate-oblong, .7x1.8 mm.; in section triangular, facets convex, the ventral broadest, the angles with rounded margins; markings of hexagonal ridges, the interspaces convex.

Hab.—Mangrove swamp, Sisal, Nov. 9, 1865, *Schott sine num.*

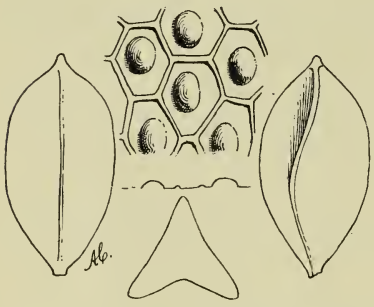
The above description and figure apply only to that form of Cyperus echinatus (Ell.) Wood, with subglobose spikes, umbel of 1–8 rays, slender culms and small tuber-like corms, not the larger form with ovoid spikes, umbels of 10–13 rays and horizontal rootstocks, and which, under the names *Mariscus ovularis* Kunth and *Cyperus Baldwinii* Torrey, are included by authors as synonyms under C. echinatus. The larger "*ovularis*" form has not been found in Yucatan.

Cyperus ligularis L. Amœn. Acad., 5:391.

Mariscus rufus H. B. K.

Mariscus ligularis Urb.

Bracts 4–7, leaf-like, 3–7 dm. long, minutely sharp serrate. Inflorescence a compound umbel, rays 8–12, 1–9 cm. long; secondary umbels congested, subcorymbose; spikes rufous, sessile or subsessile, the terminal one cylindrical, 2–3 cm. long, 1 cm. wide, the lateral deflexed, 1–2 cm. long. Spikelets reddish-brown, ellipsoid, 1.5x3–5 mm., densely crowded, divergent, 2–4-fruited; rachilla wings small. Glumes reddish-brown with a dull-green midrib, ovate, obtuse, striate, keeled, twice the length of the achene. Style longer than the achene, divided to near the base. Achene dull-black when ripe, ellipsoid, .65–.7x1.4 mm., in section sagittate triangular, the dorsal angle sharpest, dorsal facets slightly concave, the ventral deeply so; all marked by faint irregular hexagonal ridges, the interspaces plane and centrally occupied by large and prominent semi-globular papillæ.



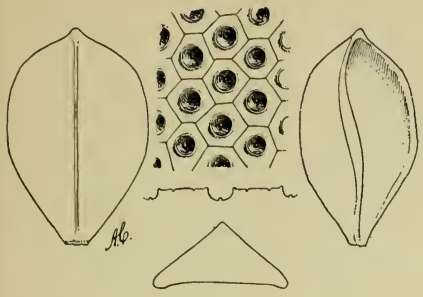
Hab.—Abundant, 3 feet high, San Felipe, *Gaumer 1401.*

yperus bruneus Sw. Fl. Ind. Occ., 1:116.

Mariscus bruneus Clarke.

Bracts 4, leaf-like, .5–2.5 dm. long. Inflorescence a dense umbel, 1.5–4 cm. wide, formed of 2–6 spikes, rays 1 cm. long. Spikes crimson-lake turning darker with age, subglobose, 14 mm. wide; spikelets about 20, oblong, compressed, divergent, 2x6 mm., 5–7-fruited. Glumes with bright-green keel, crimson-lake turning to dull rusty-brown faintly spotted with red, broadly ovate, obtuse, apiculate,

strongly nerved, nearly twice the length of the achene. Style longer than the achene, divided to near the base. Achene dull-black when ripe, broadly obovoid, .7–.9 x 1.4 mm., in section flatly triangular, the facets plane, the ventral having a prominent rounded margin at the angles, and all three marked by nearly regular hexagonal grooves, each interspace occupied by a deep circular pit with a raised lip.



Hab.—Celestun, May 13, 1864, *Schott 412;* on the apex of reef rocks, north end of the island of Mugeres, Jan. 2, 1895, *Millspaugh, Armour Exped. 22* (*Cyperus Ottonis* Field Col. Mus. Bot. 1:11); seashore near lagoon, Progreso, March 5, 1899, *Millspaugh Pl. Utowanæ 1697*, southwest end of Perez Island, Alacran Shoal, March 8, 1899, *1746* (*Cyperus Ottonis* Field Col. Mus. Bot. 2:29, and *Cyperus brizeus ibid.* p. 122.)

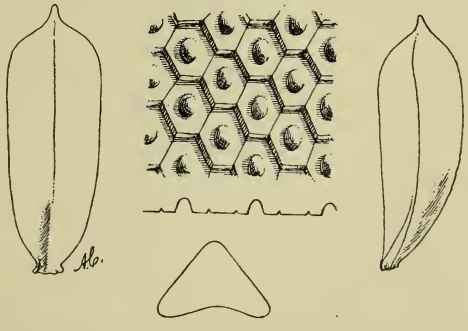
§ *TORULINIUM.*—Characters of § *Mariscus* except: Spikelets terete or subterete; rachilla deciduous in 1-fruited nodes, with broad wings clasping the achene. Spikelets more loosely disposed in pectinate or digitate spikes.

Cyperus ferax L. C. Rich. Act. Soc. Hist. Nat. 1:106.

Torulinium confertum Ham.

Torulinium ferax Urb.

Bracts leaf-like, 1–4 dm. long. Inflorescence in a compound spreading umbel, 10–20 cm. wide; primary rays 3–6, 1–10 cm. long; secondary rays 1–2 cm. long. Spikes broadly flabellate in outline, 2.5–4 x 3.5–4.5 cm., composed of 16–20 pectinately spreading spikelets. Spikelets rufous, subterete, linear, zigzag, 1 x 15–30 mm., 5–12-fruited; rachilla wings large, enfolding the achene. Glumes rufous, closely appressed to the rachilla, those of the same rank separated from each other for a distance equal to ½ their length, all ovate, obtuse, less than twice the length of the achene, the dorsum convex, not keeled, the median stripe broad, green, 7-nerved. Style twice the length of the achene, divided for ½ its length. Achene black, elongate-obovate, .45–.55 x 1.8 mm.; in section triangular, the dorsal facets plane, the ventral deeply convex; facets with sharp, hexagonal reticulations enclosing semiglobular papillæ.



Hab.—Common in moist, shady places near Izamal, 3 feet high, *Gaumer 2483, 1035* (*Cyperus* sp. Field Col. Mus. Bot. 1:354), Chichan-

kanab, *2146*, *2421;* borders of the lagoon south of Progreso, March 5, 1899, *Millspaugh Pl. Utowanæ 1671* (*Cyperus densiflorus* Field Col. Mus. Bot. 2:28), in deep woods at Chichen Itza, *1637*, *1773* (*Cyperus densiflorus* ibid.).

Cyperus lentiginosus sp. nov.

Bracts 6–10, leaf-like, 5–45 cm. long, 2–10 mm. wide, under a lens spotted with dark purple, scabrous on the upper surface and margins at least toward the summit, smooth below. Inflorescence a 10–16-rayed umbel, 1 or 2 spikes subsessile, rays 2–12 cm. (rarely to 20 cm.) long, often compound, when the secondary rachis extends at right angles to the primary one. Spikes russet brown or green, oblong, 2–2.5 cm. wide of 30–75 pectinate spikelets; rachis 1.5–4 cm. long, bractlets linear or setaceous. Spikelets little compressed, linear lanceolate, 1.3–2 x 10–13 mm., 4–6-fruited; rachilla wings membranaceous, clasping the achene nearly its entire length, pale, spotted with purple; rachilla joints 1.3 mm. long. Glumes more than twice the length of the achene, lanceolate-ovate, short mucronate, 9–11-nerved, golden brown with a green keel and conspicuously spotted with dark purple, appressed or somewhat spreading at the tips. Stamens 3. Style longer than the achene, divided ⅔ its length. Achene brown, obovate-oblong, .6-.7 x 1.8–2 mm.; in section triangular, facets concave, surface marked by faint hexagonal ridges, the interspaces occupied each by a shallow circular pit with a prominent lip. Plant 3–8 dm. high, culms erect from a short rootstock, sharply 3-angled, glabrous; sheaths scarious, thickly spotted with chestnut or purple. Leaves equaling or exceeding the culm, .5–1 cm. wide, flat, scabrous on the upper surface and margins toward the summit.

Hab.—Merida, July 2, 1865, *Schott 565;* common in moist shady places, Chichankanab, *Gaumer 1282*, *1283*, *1284*, *1286*, *1287*, *1290*, (the type, Herb. Field Col. Mus. No. 57219,) *1296*, *2145*, *2331*, San Felipe *1402*, Izamel *2487*.

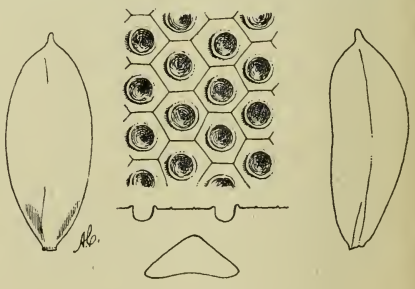
No. *433 Ad. Tonduz*, Flora Costaricensis, July, 1892, is a small and immature specimen of this species.

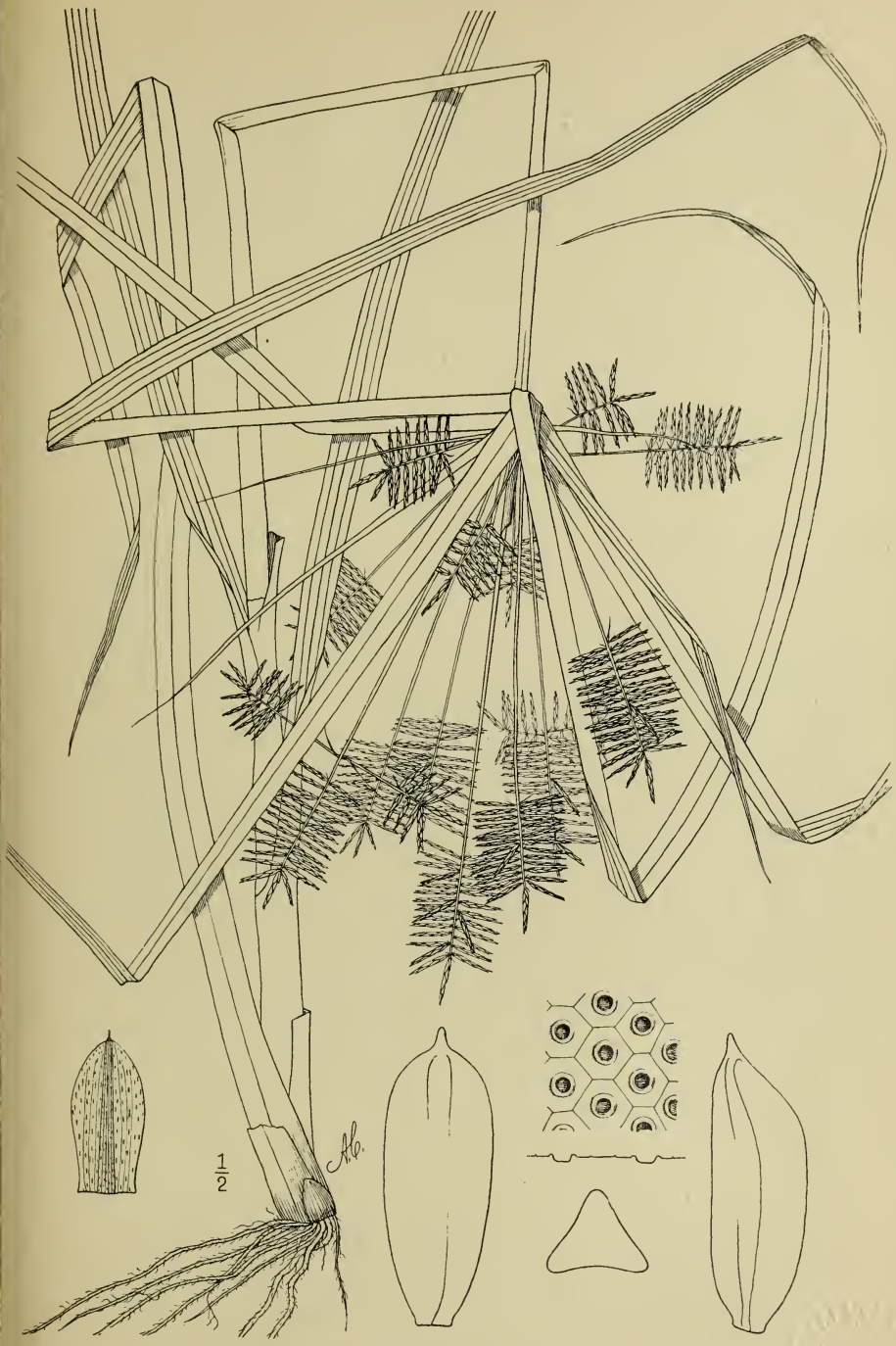
Cyperus Michauxianus Schultes Syst. Mant., 2:123.

Cyperus speciosus Vahl?

Torulinium Michauxianum Clarke.

Bracts leaf-like, 5–12 cm. long. Inflorescence a compound umbel, 15–20 cm. wide; primary rays 8–10, 1–11 cm. long; secondary rays 1–6 cm. long. Spikes oblong in outline, 1.5–2.5 x 3–4 cm., composed of 30–50 horizontally spreading spikelets. Spikelets brown, but little compressed, 1.5 x 10–12 mm., 10–12-fruited; rachilla wings smaller, enfolding the lower half of the achene. Glumes loose, obliquely spreading, slightly imbricated, reddish-brown with a broad, green, minutely striate dorsal stripe;





CYPERUS LENTIGINOSUS.

acute, submucronate, less than twice the length of the achene. Style longer than the achene, divided to near the base. Achene rusty-black, ellipsoid, .5–.6 x 1.4 mm., flatly triangular in section, the ventral facet somewhat concave; surface marked by faint hexagonal ridges, the large interspaces occupied each by a deep circular pit with a prominent lip.

Hab.—Aguada de Labcah, July 30, 1865, *Schott 566;* Chichankanab, *Gaumer 1288, 1289, 2495.*

HELEOCHARIS R. Br. Prod. Fl. Nov. Holl. 1:224.

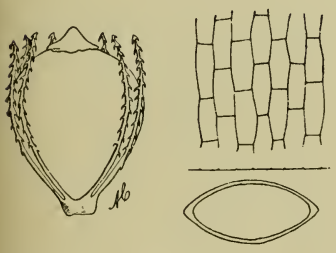
Flowers perfect, glumes many, spirally imbricated, lower empty and bracteate. Perianth of 7 bristles (in our species). Stamens 3. Style 2 or 3-cleft, its swollen base persistent as a tubercle on the achene. Achene biconvex or depressed trilateral. Inflorescence a single terminal spike.

Achene 1 mm., smooth and shining	*capitata.*
Achene 2.8 mm., reticulated	*cellulosa.*

Heleocharis capitata Torr. Ann. Lyc. N. Y. 3:298.

Scirpus capitatus L.

Spike light-brown, ovoid, obtuse, 3 x 3.5 mm.; glumes densely imbricated, the lower somewhat enlarged and bract-like; fruiting glumes brown with green midrib, broad, ellipsoidal, obtuse, twice the length of the achene. Stamens twice the length of the achene. Style 2-cleft. Bristles pale-ferruginous, retrorsely barbed, as long as, or shorter than, the achene. Achene, including the tubercle, pyriform, .7 x 1 mm.; tubercle white, .1 x .2 mm.; achene proper polished-black, in section lenticular, the surfaces longitudinally marked by faint, elongated, hexagonal reticulations, interspaces unoccupied.

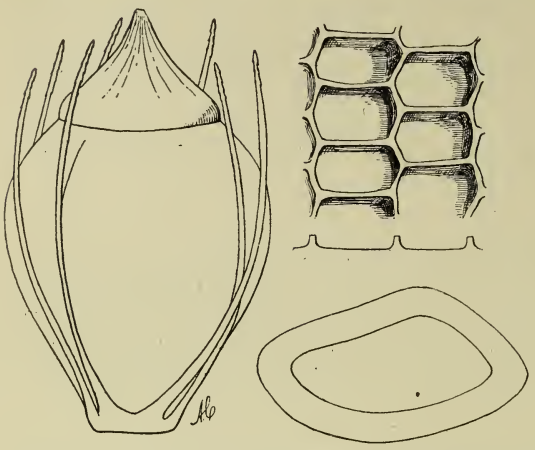


Hab.—Abundant on the margins of shallower cenotés, 12 inches high, Izamal, *Gaumer 424*, Chichankanab, *1764;* boggy soil at the Caleta, island of Cozumel, *Millspaugh Pl. Utowanæ 1526*, borders of brackish lagoon south of Progreso, *1687*, *Gaumer 2474.*

Heleocharis cellulosa (L.) R. Br. Prod. 225.

Spike pale brown, cylindrical, obtuse, .4–.6 x 20–45 mm.; glumes loosely imbricated, the lower coriaceous and appearing like a continuation of the culm; fruiting glumes twice the length of the achene, stramineous or pale green, spotted with brown, obovate, obtuse, with

a scarious margin. Stamens longer than the achene. Style 3-cleft. Bristles brown, smooth or minutely denticulate at the summit, longer than the achene. Achene, including tubercle obovoid with tapering apex, 1.7 x 2.8 mm.; tubercle stramineous, tipped with black, pyramidal, .8 mm. high, 1 mm. wide at base. Achene proper brown; in section lenticular-rhomboidal, the surfaces prominently marked by longitudinal rows of laterally elongated hexagonal reticulations.



Hab.—Sisal, *Schott sine num.*; common, Chichankanab, *Gaumer 1447*, Progreso *2402*.

DICHROMENA Michx. Fl. Bor. Am. 1:37.

Fertile flowers perfect, glumes numerous, spirally imbricated, the lower and upper empty or infertile, spikelets few-fruited. Perianth none. Stamens 2 or 3. Style 2-cleft, its base persistent as a tubercle on the achene. Achene biconvex, transversely wrinkled. Spikelets crowded in a terminal head subtended by long, leaf-like bracts.

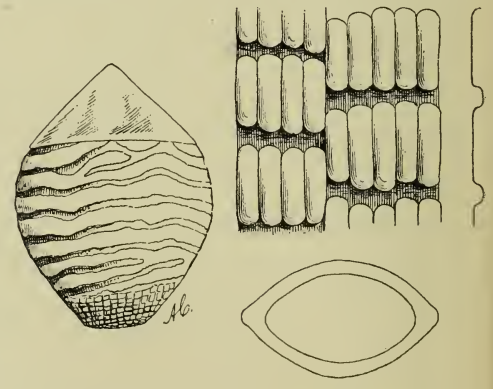
Tubercle truncate at base, head of 8–16 spikelets	*colorata.*
Tubercle sagittate, head of 1–3 spikelets	*radicans.*

Dichromena colorata (L.) Hitch. Pl. Baham. 141.

Schœnus coloratus L.

Dichromena leucocephala Michx.

Bracts 3–5, deflexed-spreading, 5–10 cm. long, basal portion white. Inflorescence in white, globose heads 10–14 mm. wide, composed of 8–16 ovoid spikelets, 3 x 5–8 mm., 1–3-fruited, glumes white with a hyaline border, conoid, subacute, keeled, nearly three times the length of the achene. Stamens 2. Achenes (excluding the beak) dark cinnamon-brown, obovoid, 1.2 x 1.15 mm. Beak broadly-conical, darker than the achene, .5 mm. high. Achene in section lenticular, the angles strongly marked, the

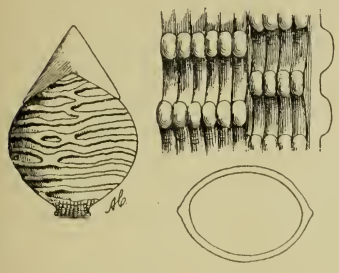


surfaces marked by prominent horizontal intermitting ridges composed of oblong, raised cells, the interspaces shallow and narrow.

Hab.—Mangrove swamp, Sisal, Nov. 9, 1865, *Schott 176.*

Dichromena radicans Cham. et Schl. Linnea 6:38.

Bracts 3–5, minutely ciliate and sometimes white at the base. Heads 8 x 10 mm., composed of 1–3 light cinnamon-brown spikelets 9 x 3 mm., lanceolate, 5-fruited; glumes with darker cinnamon keel, triangular-ovate, obtuse, 3 times the length of the achene. Stamens 3. Achenes (excluding the beak) dark brown, orbicular, .9 x 1 mm. Beak black, sharply conical, sagittate, .3 mm. high. Achene in section elliptical, the angles slightly marked; the surfaces marked by about 12 horizontal, intermitting ridges composed of small, oblong, raised cells, with deep broad interspaces.



Hab.—Boggy soil, center of the island of Cozumel, Feb. 20, 1899, *Millspaugh Pl. Utowanæ 1562.*

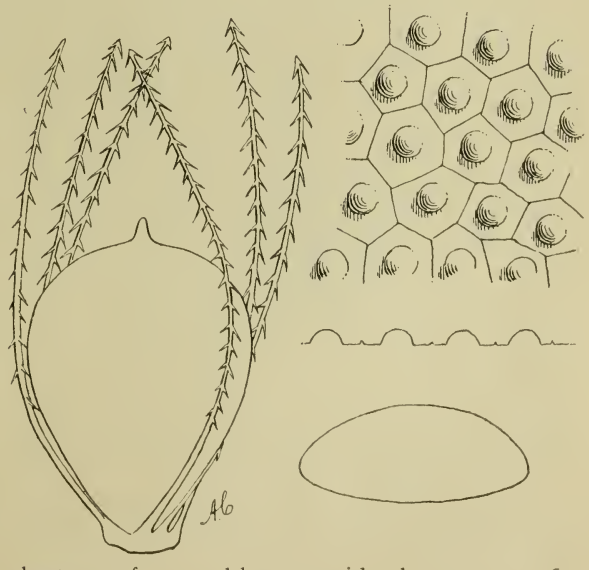
SCIRPUS L. Sp. Pl. 47.

Flowers perfect, glumes many, spirally imbricated. Perianth of 2–6 bristles. Stamens 3. Style (in our species) 2-cleft, wholly deciduous. Achene biconvex. Spikelets solitary or variously clustered at the summit of the culm.

Scirpus validus Vahl Enum. 2:268.

Scirpus lacustris of American authors not Linnæus.

Inflorescence a compound, lax, more or less drooping umbel, subtended by a single erect, attenuate, terete bract, channeled at the base, 1–4 cm. long; rays 1–4 cm. long, flattened, scabrous; bractlets lanceolate, mucronate, scarious, pubescent toward the summit, fimbriate-ciliate; secondary rays .5–4 cm. long, like the primary. Spikelets in capitate clusters of 1–5; oblong-ovoid, obtuse, 3–4 x 6–9



mm., ferruginous to chestnut. Glumes broadly ovate, obtuse or emarginate, mucronate, thickly spotted with chestnut or purplish brown ("*purpureo punctatæ*," Vahl), with a green keel, fimbriate-ciliate, sparsely pubescent with minute barb-like hairs, especially toward the summit. Style 2-cleft to near its base. Bristles 6, reddish brown, retrorsely barbed, longer than the achene. Achene grayish black when mature ("*flavescens*" before it is fully ripe), obovoid, narrowed at the base, abruptly mucronate 1.4–1.5 x 2 mm.; in section unequally biconvex; the surface marked by irregular hexagonal reticulations, the interspaces occupied each by a small papilla.

Hab.—Aguada de Labcah, July 30, 1865, *Schott 566a*, *567*, salt swamps, Sisal, Oct. 25, 1865, *690;* abundant on the margins of the shallower cenotés, 8 feet high, Izamal, Feb. to March, *Gaumer 423* (*Scirpus lacustris?* Field Col. Mus. Bot. 1:290).

Called HALAL, "cane," by the Mayas, and used for making floor mats, called POP.

FIMBRISTYLIS Vahl Enum. 2:285.

Flowers perfect, glumes many, spirally imbricated, lower short and empty. Perianth none. Stamens 3. Style 2-cleft, wholly deciduous. Achene biconvex. Inflorescence more or less compound umbellate.

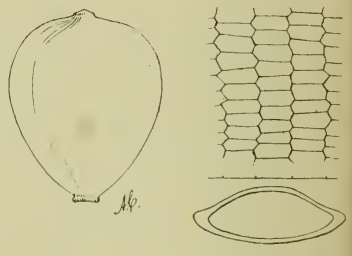
Achene faintly reticulated	*ferruginea.*
Prominently ridged:	
Pale, tapering at summit	*laxa.*
Dark, truncate at summit	*spadicea.*

Fimbristylis ferruginea (L.) Vahl Enum. 2:291.

Scirpus ferrugineus L.

Fimbristylis stans Spreng.

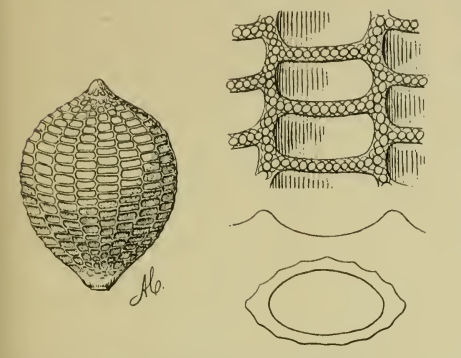
Bracts about 3, leaf-like, 1–3 cm. long. Inflorescence umbellate, several rayed with one spike sessile; rays 2–3 cm. long; spikes ferruginous, ovoid, obtuse, 8–10 x 4–5 mm., sometimes continuing to grow and fruit at the apex after the lower glumes and achenes have fallen, making entire length of rachis nearly 2 cm.; bractlets short, setaceous, glumes ferruginous with green midrib, ovate, subacute, apiculate, upper part minutely pilose, 3-times the length of the achene. Style twice the length of the achene, broadly flattened and villous below the forking. Achene pale brown, obovoid, 1.1 x 1.4 mm.; in section irregularly lenticular, the dorsum gibbous; surfaces faintly marked by longitudinal rows of laterally elongated hexagonal reticulations.



Hab.—Borders of brackish lagoon north of island of Cozumel, *Millspaugh Pl. Utowanæ 1594* (*Fimbristylis spadicea* Field Col. Mus. Bot. 2:29).

Fimbristylis laxa Vahl Enum 2:292.

Bracts 2 or 3, leaf-like, 2–6 cm. long, pubescent on the lower surface. Inflorescence a corymbose umbel of 3–6 rays with one sessile corymb. Rays 1–4 cm. long. Corymbs of 2–5 spikes, one sessile, secondary rays .3–2 cm. long. Spikes rufous brown, ovoid, obtuse, 2.5–3 x 5–7 mm.; bractlets setaceous, 3–10 mm. long; glumes rufous with a light green midvein, broader than long, obtuse, subspiculate, twice the length of the achene. Style little longer than the achene, villous to near the base. Achene pale stramineous, somewhat iridescent, obovoid with acute apex, .8–.9 x 1.2 mm.; in section lenticular; surfaces marked by about 16 longitudinal papillate ridges, the interspace transversely marked by less prominent similar ridges.



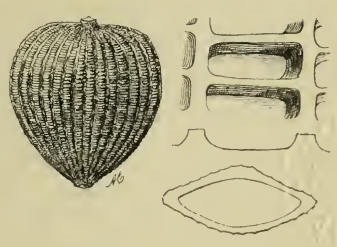
Hab.—Pocoboch, *Gaumer 2376.*

Mr. C. B. Clarke in Urb. Symb. 2:77, makes F. laxa a synonym of F. diphylla Vahl, Enum. 2:289; but Vahl's descriptions of these two, though brief, indicate distinct species which, with the fact that the locality for diphylla is given as "India *orientali*," and that for laxa as "America *meridionali*," seems sufficient to warrant retaining the name laxa for the American form.

Fimbristylis spadicea (L.) Vahl Enum. 2:294.

Scirpus spadiceus L.

Bracts 3–4, leaf-like, scabrous on the margin, 13–25 cm. long. Inflorescence a compound umbel, rays 1–6 cm. long; secondary umbels of 3–9 spikes; spikes chestnut, ellipsoidal, subacute, 4 x 10 mm., continuous at the apex as in F. ferruginea; bractlets short, setaceous; glumes chestnut with green midvein, chitinous, broadly ovate, obtuse, subapiculate, 3-times the length of the achene. Style twice the length of the achene, villous throughout. Achene dark-fuscous, truncate-obovoid, .95 x 1.1 mm.; in section lenticular, the dorsum strongly gibbous; surfaces prominently marked by longitudinal lines composed of rows of broad reticulations enclosing deep oblong pits.



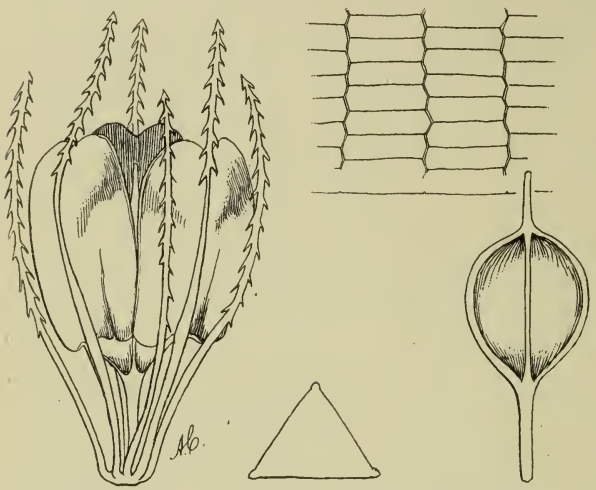
Hab.—Mangrove swamp, Sisal, Nov. 9, 1865, *Schott 907;* "uncommon," Chichankanab, *Gaumer 1449.*

FUIRENA Rottb. Descr. et Ic. 70, t. 19, f. 3.

Flowers perfect; glumes numerous, spirally imbricated. Perianth of 3 stipitate, awned sepals alternating with 3 barbed bristles. Stamens 3, style 3-cleft. Achene sharply 3-angled, stalked. Spikelets in clusters or fascicles at the summit of the culm or its branches.

Fuirena simplex Vahl Enum. 2:384.

Spikelets many-flowered, in terminal or axillary clusters, subtended by a pubescent leaf-like bract, 1–2 cm. long, the cluster 1.5–2 cm. in diameter; spikelets cylindrical ovoid, brownish-green. Glumes pubescent, obovate, obtuse, bearing a spreading scabrous awn nearly their own length. Sepals reddish-brown, cordate, spongy thickened toward the summit, emarginate, bearing a barbed awn from the back, exceeding the achene and bristles which are slender and retrorsely barbed. Achenes stramineous, shining, stipitate and beaked, the body triangular-ovoid, .9 x 1 mm.; in section triangular, the angles with rounded margins; the surface faintly marked by horizontally elongated hexagonal reticulations.



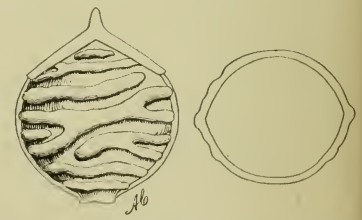
Hab.—Sisal, Nov. 9, 1865, *Schott 908;* "common," Chichankanab, *Gaumer 1339.*

RHYNCHOSPORA Vahl Enum. 2:229.

Inflorescence loosely paniculate. Spikelets 2–4 flowered, lower flowers perfect, upper imperfect. Glumes spirally imbricated. Style 2-cleft. Achene biconvex, transversely wrinkled, the base of the style persistent as a tubercle. Bristles in our species wanting. Stamens 3.

Rhynchospora micrantha Vahl Enum. 2:231.

Inflorescence a slender, elongated panicle of 3-several lax corymbs, overtopped by leaf-like bracts; axis slender, glabrous. Corymbs 2–4 cm. in diameter, of 10–30 spikelets; branches capillary, bractlets subulate. Spikelets in clusters of 1–3, 1-fruited, 1.5–2 mm. long; lower empty glumes linear lanceolate, fruiting glume ovate,



mucronate. Achene .9 x 1 mm., light brown, orbicular, transversely rugose, the 2 angles prominent, smooth; tubercle depressed-decurrent, nearly as wide as the achene, rusty black; achene in section turgid biconvex.

Hab.—"One foot high, common in the forests of Buena Vista Xbac, September," *Gaumer 1115*.

CLADIUM P. Br. Civ. and Nat. Hist. Jam. 114.

Inflorescence elongated paniculate. Spikelets 1–4 flowered, perfect, the upper only perfecting fruit. Glumes spirally imbricated. Style 3-cleft; bristles (in our species) none. Achene ovoid, more or less drupaceous. Stamens 2–3.

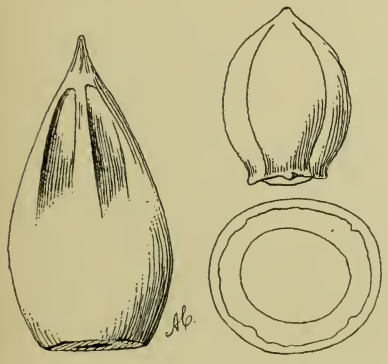
Cladium Mariscus (L.) R. Br. Prod. 236.

Schœnus Mariscus L.

Cladium Jamaicense Crantz.

Cladium Germanicum Schrad.

Inflorescence an elongated panicle of 5–10 dense, many-flowered corymbs, overtopped by long-attenuate, sharply serrate leaf-like bracts; axis subterete, flattened or channeled on one side, smooth, stiff. Corymbs 5–9 cm. in diameter, branches slender, smooth, bractlets subulate, sharply serrulate. Spikelets 5–15 in a fascicle, chestnut, 2-flowered. Glumes ovate, obtuse, the lower empty and ½ the length of the upper; the upper flower only perfecting fruit. Achene 1.5 x 3 mm., ovoid, acute, tapering or truncate at base, chestnut brown, "*drupacea, exocarpio plus minus spongioso in sicco fragili, endocarpio duro;*" in section suborbicular. The "endocarp" or nutlet 1.1–1.2 x 1.8 mm., ashy black, granular, slightly 4-lobed, truncate and more strongly lobed at base.



Hab.—Salt swamps, Progreso, April 3, 1865, *Schott 298;* abundant on margins of cenotés, 12 feet high, Izamal, March, *Gaumer 436* (*Cladium Germanicum* Field Col. Mus. Bot. 1:290), Chichankanab *1348*.

Called Holché, "tree-like herb," by the Mayas.

None of the specimens from Yucatan have mature fruit, and having no mature fruit of the species from the American tropics (*Broadway 780* Grenada, ex herb. Krug et Urban, being past maturity and having shed all its fruits), the illustration is drawn from a specimen from "Baltic shore, Germany," coll. Dr. Schmidt 1829, the identity of *Cladium Germanicum* and C. Mariscus being taken on the authority of Mr. C. B. Clarke (in Urb. Sym. 2:134, 135), where the range is given: "Distrib. in temperatis et calidis orbis fere totius." Evidently a variable species; the drupaceous character of the fruit rendering it less constant than is the case in other of the Cyperaceæ.

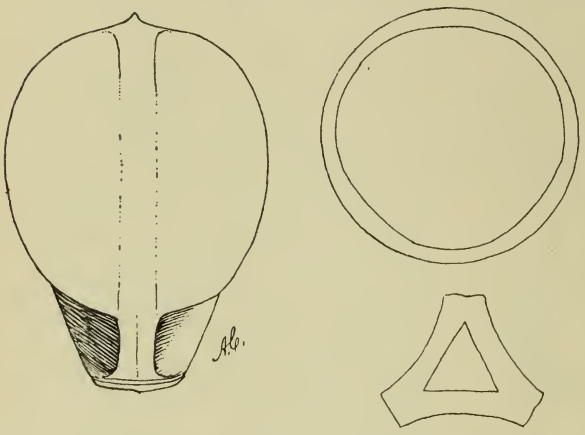
SCLERIA Berg. Kongl. Acad. Sv. Handl. 26:142.

Flowers all unisexual; staminate and pistillate spikelets separate or borne in the same cluster. Fertile spikelet 1-flowered; staminate many-flowered. Scales imbricated, the lower empty. Bristles none. Stamen 1. Style 3-cleft; achene bony, supported on a hypogynous disk or hypogynium obsolete.

Scleria lithosperma (L.) Swartz Prod. 18.

Scirpus lithospermus L.

Bracts leaf-like, 6–10 cm. long. Inflorescence a slender few-flowered panicle, 12–20 cm. long; branches distant, 3–6 cm. long; rachis minutely pubescent, 3-angled. Fascicles of spikelets .5–2 cm., distant; staminate spikelets 5 mm. long, reddish-brown or green; fertile spikelets 4 mm.; glumes 4, reddish, subulate, the outer 6–7 mm., the inner 4–5 mm. long. Achene shining-white, marble-like, 1.8 x 2.5 mm., obovoid with a triangular base, excavated between the broad angles; hypogynium reduced to a reddish line at the base; achene in section orbicular above, triangular below. The surface of the achene is sometimes minutely rugose but the wrinkles disappear when fruit is fully ripe.



Hab.—Abundant, San Felipe, *Gaumer 1400*, Pocoboch *2377*.

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